# THE CAPITALISATION OF BUSINESS RATES: AN EMPIRICAL STUDY OF TAX INCIDENCE IN SIX LONDON BOROUGHS

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## ABSTRACT

This work is concerned with tax shifting and capitalisation of recurrent taxes on immovable property, known as *business rates* in the United Kingdom and payable by occupiers of business property.

The empirical research seeks to identify to what extent business rates are transferred into rents and thus capitalised. If the tax is capitalised, then freehold owners will bear the burden of the tax. If not, the tax may be shifted in some other way, for example, reducing the occupiers' profits or increasing the prices charged to customers. The extent of any tax shifting will be affected by the value of any benefits received by the occupier in exchange for the tax paid.

Previous studies of business property tax incidence in the UK have met with mixed results and problems of poor and inadequate data have hampered research efforts. In this work particular emphasis has been given to detailed data collection, which has been carried out in the field at the property unit level and, by using this meticulous approach, it was possible to control for data issues that have confounded earlier studies.

The empirical research is based on data collected for business properties in six London boroughs. Matched pair data has been collected for industrial, retail and office property. The study takes advantage of a one-off historic situation that existed before the introduction of the Uniform Business Rate in 1990. At that time, large differences in the property tax burden existed between many local authority areas and these differentials had been present for several years.

The chief hypothesis predicts that property values will gradually adjust so that total occupation costs between matched pairs of properties will be equalised over time. The results of the empirical study confirm the hypothesis and show that total occupation costs do tend to be equalised in the long term. The results justify the painstaking approach to data collection that was an important part of the overall research design.

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# CHAPTER 1

# BACKGROUND AND INTRODUCTION

## 1.1 INTRODUCTION

This chapter sets the context to the study and outlines the structure of this thesis. The aim of this work is to examine the long-term impact of tax shifting and the capitalisation of recurrent taxes on immovable property, known as *business rates* in the United Kingdom and payable by occupiers of business property. The empirical research, which is focused on London, seeks to identify to what extent business rates are transferred into rents and thus capitalised.

Taxation is by far the most important source of government revenue in the modern economy, representing 93% of revenue raised in 2000 (ONS 2002a). In this work a tax is defined as a levy made by a public authority for which nothing is received *directly* in return. That is not to say that no benefit accrues to the taxpayer but rather that no directly attributable benefit is received in exchange for the tax payment. Taxes represent a transfer of resources from the private sector to the public sector but, in addition to this transfer, they can introduce distortions into the economy and so impose an additional burden on the community over and above the amount of tax paid.

These costs can be described as the excess burden of taxation and one obvious example of such a distortion is the reduction in spending power experienced by income tax payers. This distortion will affect consumers' choices and influence economic behaviour; taxes may also influence producers' choices between factors and, in these ways, taxation imposes an additional burden on society. The ideal tax is economically neutral and will raise revenue in such a way as to avoid distortionary effects (see Kay and King 1990 at p. 19 for a more detailed discussion of fiscal neutrality in the tax system).

An examination of the excess burden is a central part of this research, which seeks to identify the extent to which the UK property tax is capitalised. *Tax capitalisation* describes the effect on the market price of an asset because of the impact the tax has on the expected yield or return from the asset. The capital value of a property reflects the present value of expected future net rental income. If the net income is reduced by the imposition of the tax, this

reduction will be capitalised, resulting in lower capital values. In this thesis, any reduction in rental value caused by the imposition of a property tax will be treated as causing a corresponding reduction in the capital value. This simplification is discussed in more detail in 2.9.

## 1.2 TAX CLASSIFICATION

It is possible to classify taxes in a variety of ways. A detailed classification is made by the Organisation for Economic Co-operation and Development (OECD 1976). Taxes are grouped into categories and each group is further subdivided (Table 1.1).

**Table 1.1: Extract from the OECD Classification of Taxes**

| | | | |
|---|---|---|---|
| *1000* | *Taxes on Goods & Services* | | |
| *2000* | *Taxes on Income Profits and Capital Gains* | | |
| *3000* | *Social Security Contributions* | | |
| *4000* | *Taxes on employers based on payroll or manpower* | | |
| *5000* | *Taxes on net wealth and immovable property* | | |
| | 5100 | Recurrent taxes on net wealth | |
| | | 5110 | Paid by households and institutions |
| | | 5120 | Paid by corporate enterprises |
| | 5200 | Recurrent taxes on immovable property | |
| | | 5210 | Paid by households |
| | | 5220 | Paid by enterprises |
| | | 5230 | Paid by institutions |
| | 5300 | Non-recurrent taxes on net wealth | |
| | | 5310 | On net wealth |
| | | 5320 | On immovable property |
| *6000* | *Taxes and Stamp Duties on gifts, inheritances and on capital and financial transactions* | | |
| *7000* | *Other taxes* | | |

*Source: OECD Revenue Statistics (1976)*

This thesis is concerned with OECD Class 5220, *recurrent* taxes on immovable property paid by enterprises. It focuses on business property, giving no consideration to the residential sector. OECD Class 5320 deals

with *non-recurrent* taxes on immovable property. This is represented by inheritance tax in the United Kingdom and is not considered in this thesis. In the UK, recurrent taxes on business property are known as non-domestic rates or business rates. They represent a local business tax that is charged on commercial and industrial properties. Business rates are paid by the occupiers of business property and the tax base is assessed on the imputed annual rental value of a property, known as the *rateable value*. This represents the basis against which the tax payable is calculated. The annual tax rate is a multiplier, expressed as an amount per pound of rateable value and the tax payable is calculated using the tax rate as a multiplier against the rateable value. The operation of the UK rating system is explained in more detail in Appendix 1.

## 1.3 THE IMPORTANCE OF BUSINESS PROPERTY

*Business property* is defined to include all types of urban commercial and industrial property, including shops, offices, factories and warehouses. Factories and warehouses are grouped together and treated as industrial property in this thesis.

Business property is an essential factor of production in every sector of the economy. Unlike the housing sector, which has long been recognised as having a profound economic influence, the importance of commercial property is less often considered and it is only in the past two decades that the importance of business property in the economy has begun to be appreciated.

The following extract from the Commercial Property Quarterly Review (BPF 2002) illustrates the importance of business property to the UK economy:

> The broad contribution of business property as a factor of production in all sectors of the economy is 5.6% of Gross Domestic Product (GDP).
>
> As an asset, the total value of business property in 2000 stood at over £625 billion, which was more than double the value of outstanding government securities and about one half of the value of the total UK equity market.

Business property accounted for 27% of the total UK investment in 2000.

Rental income from business property in 2000 amounted to £79 billion per annum (representing 8.48% of GDP in that year).

Business property represents 46% of private sector non-financial assets, 71% of total assets of financial corporations and 75% of public sector assets.

Given the clear importance of the business property sector to the economy as a whole, it is surprising how little attention is given to the sector by economic commentators.

In a report on the role of business property in the UK economy, Currie and Scott (1991) conclude that coverage of the sector in the official statistics is substandard in quality and deficient in coverage. This problem has been exacerbated in recent years by cutbacks and discontinuation of some valuable and informative aggregate statistics (Pratt 1994 at p. 57).

## 1.4 THE SIGNIFICANCE OF BUSINESS RATES

The importance of business rates as a proportion of taxes raised in 2001–02 is shown in Table 1.2 and Table 1.3. Business rates are the sixth largest source of government revenue, representing 5.1% of all government revenue and the second most important source of revenue from business taxes.

In the fiscal year 2001–02, the yield from business rates was £18.2 billion (Inland Revenue 2002). GDP in the same period was £989 billion (ONS 2002b). Business rates accounted for 1.84% of GDP in the year, which represents a fairly significant proportion. If business property as a factor of production made a contribution of 5.6% to GDP (BPF 2002), then business rates can be seen to represent a sizeable tax on the business property sector.

**Table 1.2: UK Tax Revenue for All Taxes 2001–02**

Amounts: £ Billion

| Tax | £ Amount | % of Total |
|---|---|---|
| Income tax (net of tax credits) | 107.6 | 29.9 |
| National Insurance Contributions | 63.2 | 17.6 |
| Value Added Tax | 61.1 | 17.0 |
| Corporation Tax | 32.4 | 9.0 |
| Fuel Taxes | 21.9 | 6.1 |
| Business Rates | 18.2 | 5.1 |
| Council Tax | 14.9 | 4.1 |
| Tobacco Duties | 7.8 | 2.2 |
| Stamp Duties | 7.1 | 2.0 |
| Alcohol Related Duties | 7.0 | 1.9 |
| Vehicle Excise Duties | 4.4 | 1.2 |
| Capital Gains Tax | 2.9 | 0.8 |
| Inheritance Tax/Capital Transfer Tax | 2.3 | 0.6 |
| Customs Duties | 2.0 | 0.6 |
| Petroleum Revenue Tax & Oil Royalties | 1.9 | 0.5 |
| Insurance Premium Tax | 1.9 | 0.5 |
| Betting, Gaming & Lottery | 1.4 | 0.4 |
| Air Passenger Duty | 0.8 | 0.2 |
| Climate Change Levy | 0.6 | 0.2 |
| Landfill Tax | 0.5 | 0.1 |
| | **359.9** | **100.0** |

*Source: Inland Revenue Statistics (2002); Local Government Financial Statistics, ODPM (2003); HM Customs & Excise Annual Report (2002); Financial Statistics, ONS (2002). Figures are ranked in order of contribution size.*

**Table 1.3: UK Tax Revenue for Business Taxes 2001–02**

Amounts: £ Billion

| Tax | £ Amount | % of Total |
|---|---|---|
| Corporation Tax | 32.4 | 61.7 |
| Business Rates | 18.2 | 34.7 |
| Petroleum Revenue Tax & Oil Royalties | 1.9 | 3.6 |
| | **52.5** | **100.0** |

*Source: Inland Revenue Statistics (2002); Local Government Financial Statistics, ODPM (2003); Financial Statistics, ONS (2002). Figures are ranked in order of contribution size. Excludes taxes paid partly by businesses and partly by individuals.*

It is clear that the impact of the tax is worthy of detailed consideration, yet, in proportion to their importance in the economy, business rates have been the subject of limited research effort. In part this problem arises because of the difficulty of obtaining satisfactory data for analysis. At the local level property information is difficult to obtain (see 1.6) whilst at an aggregate level the statistical coverage of the sector is sparse, and these data may not be appropriate to answer empirical questions about tax incidence (see 4.5).

## 1.5 SOME POSSIBLE IMPACTS OF BUSINESS RATES

In the first systematic consideration of local business taxes in the UK, Bennett and Krebs (1988), identify five possible tax impacts from the point of view of businesses.

1. Influence on overall profitability
2. Influence on investment
3. Influence on reinvestment
4. Influence on choice of factors
5. Influence on other economic entities through tax shifting

These points are interrelated and the impact of the tax is both complex and difficult to analyse effectively. This thesis concentrates on the last point, seeking to identify the extent of tax shifting for business rates. This is the question of tax incidence, which can be considered at two levels, formal incidence and economic incidence.

The formal incidence of any tax is easy to establish. This falls on the person who is legally responsible for payment of the tax, but it would be a great oversimplification to assume that the burden of rates falls entirely on the person who pays the tax demand.

Economic incidence is a more useful concept, which has concerned economists for many years (see for example Marshall 1897; or Ramsey 1927). Urban economists have also long been interested in answers to the more specific question 'Who bears the burden of the property tax?'

The identification of economic incidence requires an analysis of the extent of tax shifting. Property taxes can be shifted, either forwards through increased prices, or backwards through reduced payments to suppliers or factors of production (such as land or labour). The burden of the tax could, of course, remain with the occupier, in which case the formal incidence and the economic incidence might appear to be the same, but even then the effect of the tax would be to reduce profits, which would be borne by shareholders and might even be capitalised in the form of lower share prices caused by reduced equity earnings.

Economic incidence can be analysed at different levels, because there may be several intermediate bearers of the economic incidence before the final economic incidence of the tax is identified. Any analysis of final incidence will include an assessment of the full effects of a tax on the economy as a whole, known as a *general equilibrium analysis* of taxation. Any analysis that does not seek to identify the full effects of a tax on the economy as a whole is known as a *partial equilibrium analysis.*

It is also necessary to consider the time frame of the analysis. The short run impacts will differ from the long-term impact and this research is directed towards a long-term analysis. This long-term analysis is essential when analysing tax impacts on property values, due to contractual rigidities in the property market and the slowly changing nature of the spatial relationship being observed.

There is a further important point that needs to be considered before the burden of the tax can be analysed in a meaningful way, and that is the value of any benefits that accrue to the taxed entity and which can be attributed to the tax payment. This is known as a *benefit offset.* The value of any benefit offset needs to be taken into account in assessing the extent of any tax shifting. Related to the idea of a benefit offset is the possibility that the benefits from the local public goods exceed the value of the tax and are themselves capitalised, resulting in increased property values in the jurisdiction concerned.

It is a singular characteristic of the UK empirical research into business property tax incidence that the benefits received by businesses are almost completely disregarded. This may in fact be an acceptable approach, due to the centralised nature of government and the homogeneity of local government services across the UK. What is surprising in nearly all UK work on business tax incidence, is that the question of benefits is not even considered.

## 1.6 DIFFICULTIES WITH DATA

Reference has already been made to the problem of inadequate statistical coverage of the property market and the related problem that is encountered by academic researchers in the field of real property, namely the difficulty of obtaining adequate data. This problem was explored in the context of business property by Dunse et al. (1998).

Partly as a consequence of the difficulties of obtaining adequate data, the opportunity to identify the long-term economic incidence of business rates in the UK has proved elusive and those studies of tax incidence that have been undertaken have met with mixed results.

None of the British studies found significant results for the long-term impact of business rates, which is the focus of the present work. Some studies have obtained short-run results (see for example Bennett and Fearnehough 1987; Bennett and Krebs 1988; Bond et al. 1996a), but the results of UK studies are not always as strong as the authors had expected (e.g. Sibley 1989 at p. 340; Crosby and Keogh 1990 at p. 25; Bond et al. 1996b at p. 31).

Moreover, problems of data availability have hampered research efforts. Bond et al. (1996b at p. 30), commenting on the data used in the most recent UK research on the incidence of business rates, state 'Unfortunately, we had very little information on the attributes of the properties within our sample'. This research was carried out for the Department of Environment by the Institute of Fiscal Studies and the final report states that 'It would be of great interest to extend this analysis to data on a wider range of properties, but it is not clear where such data could be obtained.' (DOE 1995b at p. 63).

In this thesis particular emphasis is placed on detailed data collection, which has been carried out at the level of the individual property and which gives complete information on the attributes of the properties used. This follows the approach to data collection adopted by Cheshire and Sheppard (1995) in a hedonic analysis of residential property (which was not concerned with tax incidence). Instead of a hedonic analysis, which would require a very large data-set, the empirical research in this thesis is based on data for a small sample of matched pairs that were collected for industrial, retail and office property in adjoining local authority areas. By using this approach it was possible to control for the issues that have confounded earlier studies.

There is a full discussion of the data requirements and data collection in Chapters 6 and 7.

## 1.7 AIMS OF THIS RESEARCH

This study sets out to establish the economic incidence of business rates. In particular, it seeks to identify to what extent business rates are reflected in rents, and thus capitalised, in the long term. There are no previous long-term studies of the impact of business rates in the UK.

The chief hypothesis employed is that property values will adjust so that total occupation costs between matched pairs of properties will be equalised over time in response to variations in property taxes. It is not assumed that this process of market adjustment will be instantaneous, especially given the peculiar institutional constraints on rent adjustment in England (see 2.6.5).

The empirical research involves an investigation of industrial, office and retail properties in adjacent local authority areas, having a comparable property type, but with large differences in rate burden at the time of the study. This includes the need to consider what differential tax benefits (if any) are provided between the local authority areas under analysis.

The analysis of economic incidence is complex and it will differ in the short run from the long run and will be affected by conditions of demand and supply, which will differ for each property type and according to prevailing

economic conditions. This makes the task of estimating the economic incidence of the property tax difficult. To help reduce the complexity, this thesis undertakes a partial equilibrium analysis of tax incidence, rather than a general equilibrium analysis. This means that there is no attempt to identify the final incidence of the tax, which can only be established on an aggregate macro-economic basis, whereas this research study is local in its nature. The empirical work seeks to identify any long-term statistically significant causal relationship between business rates and business property rents.

In identifying the incidence of business rates it is possible to gain a better understanding of the impact of the tax on property values. The thesis provides new insights into the behaviour of firms in assessing competing property options, as well as having important implications for property market efficiency.

## 1.8 TIME FRAME OF THE EMPIRICAL WORK

This research takes advantage of a one-off historic situation that provides a unique opportunity for study. Before the Uniform Business Rate was introduced in April 1990, high rate differentials were present in many areas. By using these differentials as an analytical device, the aim is to identify who bears the burden of business rates.

The chief empirical work is based on cross-sectional data at April 1988 which are supplemented by data both before and after April 1988, giving a longitudinal element to the study. Figure 1.1 shows the time frame graphically.

There are other persuasive reasons for basing the study around the April 1988 date, first amongst these being availability of sufficient data at that time.

The property recession that started with high interest rates in late 1988 was not foreseen in the early part of that year. Market commentators were predicting continued rises in the property market as late as September 1988 (Key et al. 1990).

# RESEARCH TIMELINE

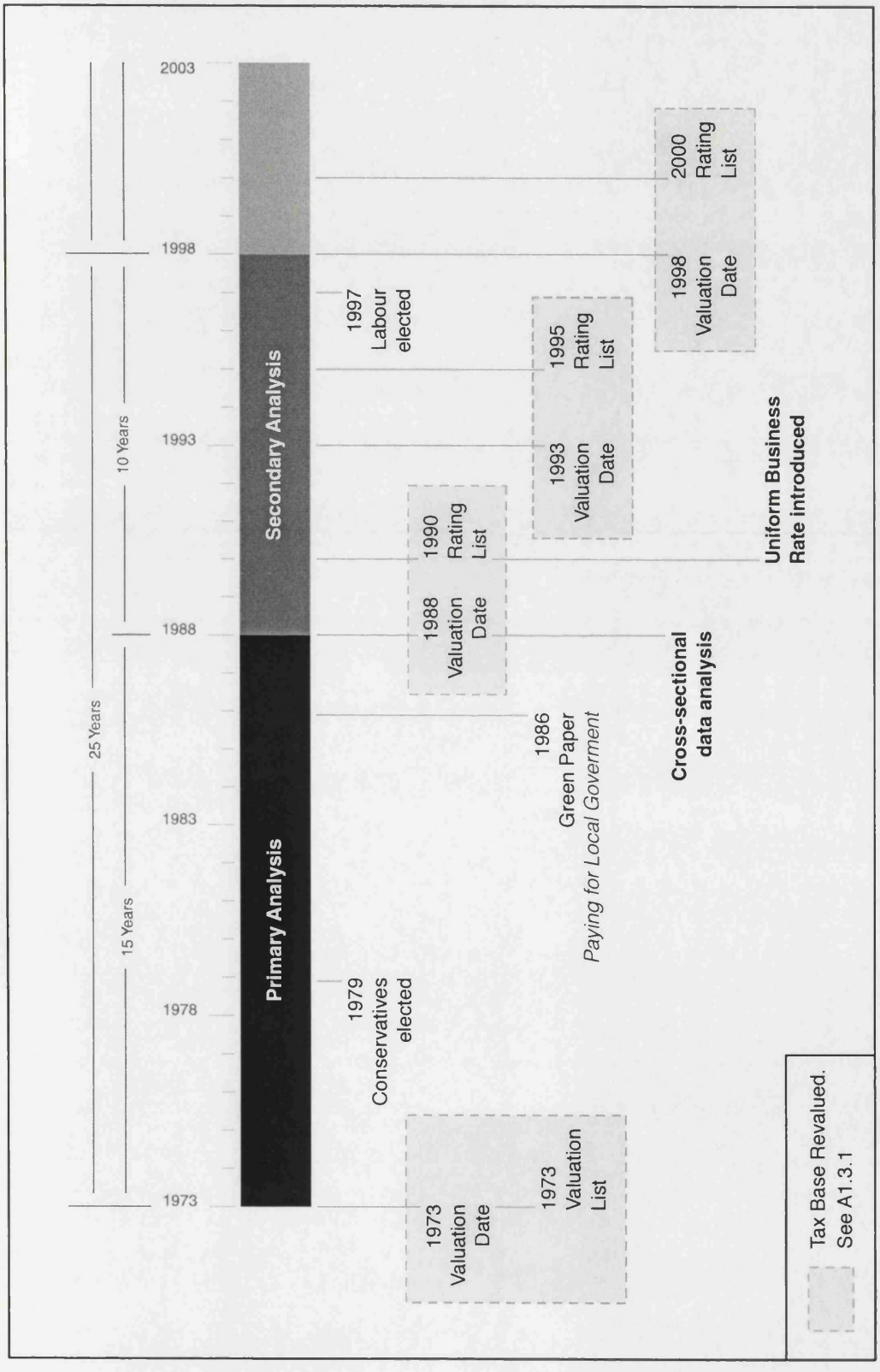



**Figure 1.1: Research Timeline**

The choice of the 1988 date for this study is therefore useful, since the analysis of tax incidence is difficult enough without the additional complication of falling property values. The analysis of tax capitalisation in stable or rising market conditions is expected to allow the tax capitalisation effect to manifest itself through the bids of competing tenants.

Also important to the choice of the 1988 date is that business occupiers must not have adjusted their occupation decisions to take account of expected changes following Uniform Business Rates that were introduced in 1990. The two year antecedent date helps to eliminate this possibility from the analysis.

A full explanation of the research design and the reasons for the date chosen is set out in Chapters 6 and 7.

In this thesis, no consideration is given to the most recent government proposals for changes to the system of business rates, as embodied in the Local Government Bill 2002/03 that was published in draft by the Office of the Deputy Prime Minister in June 2002.

## 1.9 STRUCTURE OF THE THESIS

In this thesis references to other sections appear in the text without any prefix (e.g. 4.6.5) and references to sections of an appendix are prefixed with 'A' (e.g. A1.3.2 or Table A5.2). Tables and figures will always be shown with the full prefix (e.g. Figure 6.1). Acts of Parliament and Statutory Instruments appear in full in the text and are not listed in the bibliography at the end of the thesis.

Chapter 2 studies the theory of urban land use, reviewing the theory and developing a model of how rental values are determined. It then considers the determinants of rental value, applying the theory to each of the three main types of business property. A brief look at the assessment of property capital values is made: any shifting of tax incidence to landlords in the form of reduced rent represents a capitalisation of the tax.

Chapter 3 examines taxes on property. Theories of taxation are discussed first, followed by a review of developments in tax incidence theory and their application to the property tax. It considers the different ways that the tax burden can be shifted and a model of tax capitalisation is explained.

Chapter 4 reviews the existing empirical studies in both the UK and the US, considering business property studies that are relevant to the theory that was examined in Chapter 3. Residential studies of tax capitalisation are reviewed in Appendix 4.

Chapter 5 considers the UK property tax, its history and recent development, placing it in the context of this thesis. Discussion of the political background takes place along with an explanation of the London local authority areas selected for the study.

Chapter 6 develops the methodology that is to be employed for the empirical study and sets out the research hypothesis that is to be tested. The results of a telephone survey of prospective occupiers are presented and these help to validate the research hypothesis and give an understanding of the factors (including benefits) that prospective occupiers consider when making their rental bid. Data requirements are also outlined in this chapter.

Chapter 7 deals with the data requirements in depth, explaining how the data were validated and the matched pairs of properties selected before considering the data collection process itself.

Chapter 8 contains an explanation of the statistical analysis undertaken and presents the results of the data analysis, including the pilot study and triangulation of the results.

Chapter 9 is a discussion of the results and the conclusions that can be drawn and points the way for further research.

Appendix 1 outlines the legal framework of business rates in the UK. It briefly sets out the historical background to the UK property tax and provides a technical outline of how the rating system was implemented in England and Wales prior to 1990, together with a summary of the changes made in 1990.

Appendix 2 presents a discussion of the difference between prices and valuations. It also includes a review of the technical aspects of the tax from a valuation perspective.

Other Appendices, listed in the Table of Contents, are introduced into the text as appropriate.

# CHAPTER 2

# THE DETERMINATION OF RENTAL VALUE

## 2.1 INTRODUCTION

This chapter considers how the rental value of a property is determined. The theory of rental value determination needs to be considered so that the likely impact of business rates on rental value can be assessed.

The chapter starts with some definitions and then considers a few of the problems encountered in the economic analysis of land. After a brief look at the early analysis of land by economists, the work of contemporary urban economists is reviewed.

An elementary theory of rental value determination is then developed and this is integrated with a demand and supply analysis, which is applied to each of the three types of property that are used in the empirical study.

Finally, a short review of the valuation and determination of capital values is set out.

## 2.2 DEFINITIONS

An interest in real property represents a complex bundle of rights: legal, economic and environmental, and an understanding of these concepts is necessary for an understanding of property markets.

The property considered in this thesis will be property in an urban context and it can be more precisely described as *urban property*, which is defined to mean pure land together with buildings and other capital improvements attached to the land, as well as the legal, economic and environmental rights associated with the relevant interest in the property. Urban property, thus defined, will be referred to as *business property* in this work, which does not consider residential property in any detail.

In this thesis minimal consideration is given to *pure land*, meaning land that is totally undeveloped. In the UK there is little such land in existence today. Where it is mentioned, primarily for theoretical reasons, it will always be referred to as *pure land*, to distinguish it from developed land or other urban property, which will be referred to simply as *land*.

*Economic rent* is a term having special significance to economists and is defined as the difference between total earnings and transfer earnings of an economic factor. It will always be called by its full name of economic rent. Alonso (1964, p. 16) avoids the 'thorny definitional problems that abound in the theory of rent' by placing the 'emphasis on the process by which the value of land is determined rather than on the nature of this value'.

This concept of economic rent should not be confused with rental value in the property market. The rental value of a property is defined to mean the amount that would be paid by a tenant to a landlord for the right to use a property for a given period of time. This chapter seeks to explain the economic process by which rental value is determined. Appendix 2 contains a discussion of rental value and its estimation from the technical perspective of a property valuer.

## 2.3 LAND – SEPARATE FACTOR OR SPECIES OF CAPITAL?

Modern land economics draws heavily on the work of early classical (Malthus 1820; Ricardo 1821; Von Thünen 1826) and neoclassical economists (e.g. Marshall 1890). In many aspects the traditional principles hold true, but there are some important parts of the traditional theory that have been modified. This draws us to the definition of what constitutes land, which is developed in this section.

Early economists treated land as a separate factor of production, especially as agriculture was a much more important component of total output. Today this view still serves a useful analytical and pedagogic purpose, but, whether land is a separate factor of production or simply a species of capital, is to some extent a philosophical question that has little bearing on the problem of tax incidence considered in this thesis.

Land is referred to, by mainstream economists, with labour, capital and (less frequently) enterprise, as one of the basic factors of production. Evans (1983) is critical of the way economists routinely neglect the supply side analysis of land. As a factor of production, land is usually thought of as being fixed in supply, indestructible and a 'free gift of nature'. Land is certainly durable but it cannot be considered to be indestructible, especially from an

economic standpoint and, in a modern industrial society, land cannot be considered as 'free' (Barlowe 1986 at p. 11). Most importantly, land (both pure and developed) cannot reasonably be treated as being fixed in supply. Setting aside (for the moment) the constraints imposed on supply by planning and zoning legislation, land is quite frequently treated as being fixed in supply in fundamental economic analysis and this idea is an 'integral part of the belief system of many contemporary economists' Thrall (1987 at p.136).

Musgrave and Musgrave (1989), for example, state 'turning to tax on income from land, we find the supply to be fixed. With supply totally inelastic...' (at p. 256). This would suggest a perfectly inelastic supply curve, in which case all earnings of land are economic rent. Figure 2.1a illustrates the traditional standpoint. It assumes that the supply of land is fixed. Supply cannot respond to increased demand and the same quantity of land is supplied regardless of price.

It is true that the supply of pure land at a particular location is fixed (DiPasquale and Wheaton 1996 at p. 35) and that the supply of urban property is relatively inelastic, but even a single site can be more intensively developed, through the addition of more capital to the pure land.

The consequence of this is that short-run supply is less elastic than long-run supply and it is possible to draw more than one supply curve for land, depending on how much time is allowed for supply to react to any given level of demand.

In practice, land is supplied by a number of different economic agents (current owners) who will respond to demand by increasing the supply of land available on the market. This is achieved through the signalling function of price.

Supply should therefore be considered as a flow and the supply of land as a flow is not fixed. What is fixed is the total stock of pure land, but this fundamental distinction between stocks and flows does not seem to be commonly made.

SUPPLY CURVE FOR LAND

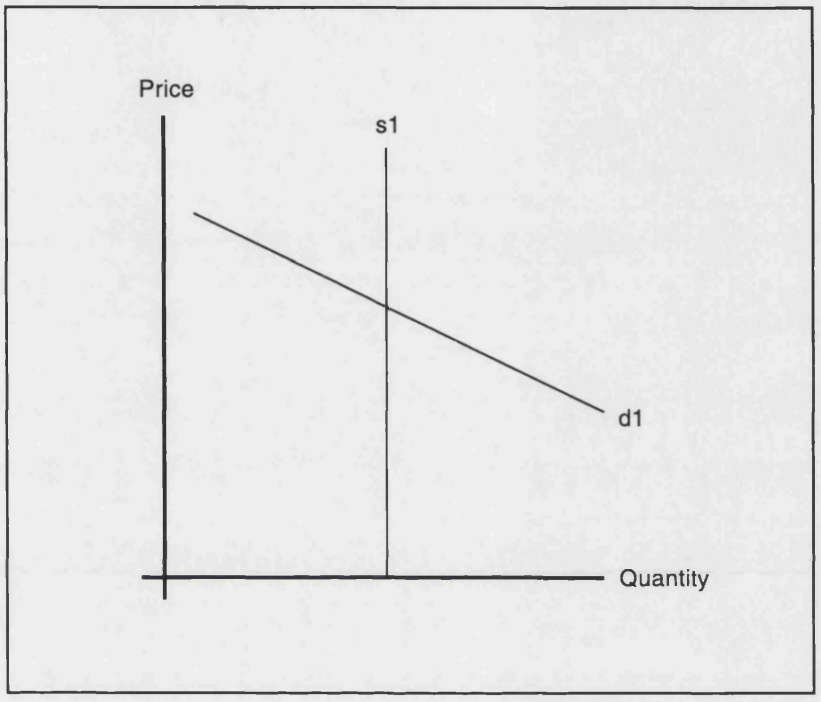



**Figure 2.1a: Perfectly Inelastic Supply**

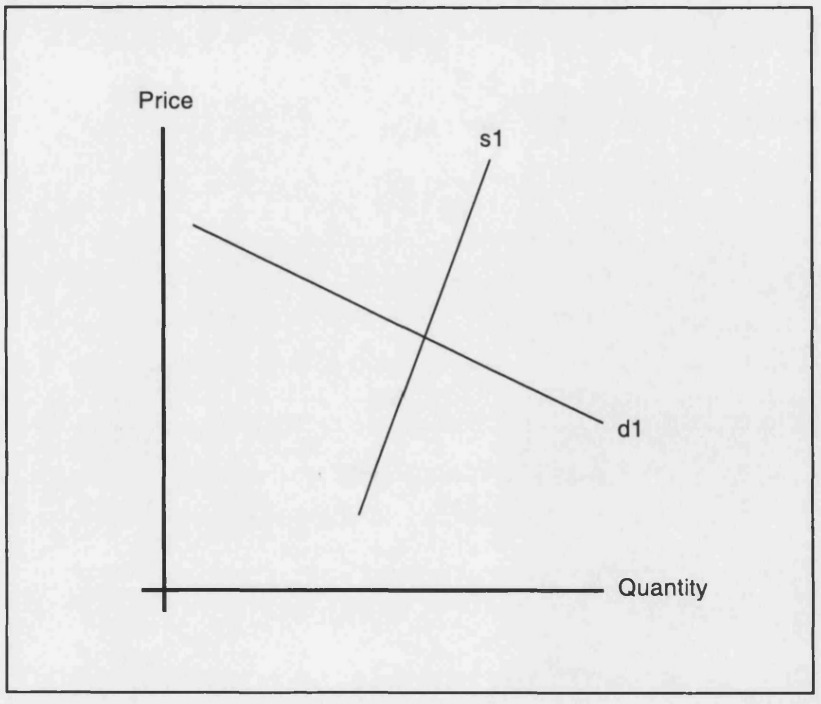



**Figure 2.1b: True Supply Curve**

Another essential factor affecting the supply of land is the differing land uses that are possible. Harvey (1992) puts it like this:

> ...the supply of land can never be regarded as fixed from the viewpoint of any one use ... additional supplies can always be bid from other uses if the proposed new use has a higher value than the existing use. Additional supplies of land can usually be created in response to additional demand by a using it more *intensively* by the addition of capital (at p. 35).

This analysis ignores legal controls on land use, which, in the UK, means the comprehensive planning controls (zoning) that have existed for the greater part of the twentieth century (Cullingworth 1992). By imposing controls on development density and restrictions on the permissible land uses, the planning system can increase or decrease the supply of land on the market (e.g. in a conservation area) and in certain circumstances this could result in a perfectly inelastic supply of urban land (Balchin et al. 2000 at p. 389).

Intensification of land use is usually achieved by the addition of capital to an existing property. Urban property will benefit by large-scale capital investment, either directly in the plot of land itself, or by infrastructure investments and adjacent property development.

Figure 2.1b shows the true nature of the supply curve for property. The treatment of supply as a flow, and the large investment of fixed capital, changes the elasticity of supply shown by the curve 's1'. Undoubtedly, the analysis of property is complicated by the dual components of pure land and fixed capital. The overall stock of pure land cannot easily be increased, whereas the stock of buildings can; the pure land component is perpetual, whereas the building component will depreciate. The proportion of pure land and fixed capital that comprise any property will determine the elasticity of its supply (Fraser 1986 at p. 356). This point is important to the consideration of tax shifting that is discussed in Chapter 3.

It can be seen that there is a very close relationship between the concepts of land and capital, and it can be difficult to distinguish between them.

Many 'observers feel that it is both theoretically and practically impossible to separate the land and improvement components' (Netzer 1966 at p.35). But developments in hedonic analysis over the last 30 years have resulted in techniques that allow the different components of a property to be analysed, making it possible to separate heterogeneous properties into more or less homogeneous parts. Hedonic pricing techniques treat a property as a composite heterogeneous good, which is made up of a bundle of homogeneous characteristics or attributes, each traded in an implicit market place and which can be valued separately to give the explicit market price for the bundle as a whole (when aggregated across attribute prices). See Sheppard (1999) for a clear and comprehensive explanation of the hedonic approach.

Recent hedonic studies by Cheshire and Sheppard (1995; 1998) in the UK, and earlier work by Jackson et al. (1984) in the US, have included location in the hedonic price function and this makes it possible to assess the 'price of land as "pure space with accessibility" '(Cheshire and Sheppard 1997). This unbundling of individual characteristics allows the land component to be distinguished from the capital improvements and other composite parts of urban property.

Unless there are analytical reasons for wanting to know the price of pure land, it is more realistic in a modern economic context to distinguish pure land from urban land, which should be more appropriately treated as capital. In this thesis no attempt is made to distinguish returns to the pure land component of business property. Returns to business property are treated as a whole, in the same way as returns to other capital. In other words, rent is viewed from a landlord's position, as a return on investment. The issue here is one of perspective and scale. From the stand-point of society, pure land may be a free gift of nature, but from the standpoint of the individual economic agent, land must be purchased or leased like any other capital good and, from this standpoint, land is usually treated as capital (Barlowe 1986 at p. 11).

## 2.4 EARLY ECONOMIC THEORIES OF LAND VALUE

Demand for land, as with any factor of production, is a derived demand that results from the demand for the products it is used to make. This basic principle has not always been recognised. The controversy that raged over the Corn Laws in the early nineteenth century hinged on two alternative views of why the price of corn (the generic term for all grain) was high. One group believed that the price was high because of the high rents charged to farmers by landowners. The other group maintained that demand for corn was high due to the Napoleonic Wars, the Corn Laws themselves and poor harvests; they maintained that the high price of corn created competition amongst farmers for land, with a consequent bidding up of rents. Prominent amongst this latter group were David Ricardo and Thomas Malthus, to whom the origins of modern rent theory can be attributed (Malthus 1820; Ricardo 1821).

The derived nature of demand for land leads to rent being viewed as a residual. Malthus recognised this when he defined rent as:

> the excess value of the whole produce, or if estimated in money, the excess price of the whole produce, above what is necessary to pay the wages of labour and the profits of capital employed in cultivation.

This is the classical definition of economic rent. Most early rent theory tended for obvious reasons to take the case of agriculture and Ricardian rent theory provides a treatment of agricultural rent, which is still the foundation of most present day rent theory.

Ricardo explained that the more fertile land would be employed first and less fertile land is only put to use as demand for agricultural product increases. Rent on the most productive land is based on its advantage over the less productive land and competition amongst farmers acts to ensure that this advantage is passed on to landlords in the form of higher rent. He recognised that transport costs were lower for land that is located closer to the market for agricultural produce and he also identified that this advantage would be passed on to the landlord as an increased rent.

This theory of locational differences was developed more fully by von Thünen (1826), again in the context of agricultural land. Von Thünen's theory introduced the *bid rent approach*, which is a cornerstone of modern land use theory and is the model used later in this chapter to illustrate the theory of rent as a residual.

The work of von Thünen has entered the economic mainstream relatively recently as a result of Isard's efforts to revive location theory and make the established German tradition available to the English speaking world (Isard 1956).

Samuelson (1983) provides an excellent analysis of von Thünen's contribution but, even today, the dimension of space is 'almost completely absent from the standard corpus of economic theory' (Krugman 1995). This neglect of spatial issues is described by Blaug (1997 at p. 596) as a 'major puzzle in the history of economic thought', although spatial analysis has for many years provided fertile ground for geographers, urban economists and regional scientists.

Early economists gave analytical primacy to agriculture, paying little heed to urban property and it is not until 1890 that attention is devoted to the topic by none other than Alfred Marshall (1890, Book V Chapter XI). He identifies *situation rent* as the additional value that accrues to urban land over the rent it would command as agricultural land. Situation rent arises on an urban site as a result of its access to markets for goods, transport links and labour markets and if a site has no situation value it is treated as agricultural land.

Although Marshall was influenced by von Thünen's work, it was not until 1964 that William Alonso formally applied von Thünen to urban land (Alonso 1964). A common problem with many early analyses is the lack of attention to the size of any particular site. To carry out an economic analysis of price without regard to quantity is hard to justify, but many early writers, with the notable exception of Marshall, appear almost universally to ignore the size of the site (Alonso 1964 at p. 5).

## 2.5 CONTEMPORARY MODELS OF URBAN LAND RENT

The 1960s and early 1970s saw the development of an important group of lineally related urban land models. The development of these models in the US is summarised concisely by Edwin Mills (1972 at pp. 63–80) and the outline below is based on his review.

Wingo's (1961) model is focused on the way urban transport costs affect land rent and the residential demand for land. He assumes that residential demand depends on the rental value of the land and the elasticity of demand is constant. Wingo sets out to explain and investigate the effect of changes in the transport system on urban land use. Wingo assumes that the outlay on land at any point in the urban area is equal to the difference between transport costs from the edge of the urban area to the city centre and from the point in question. This assumption implies that land at the edge of the urban area has no value beyond its agricultural value and that land closer to the city centre will command a rent equal to the savings in transport costs.

Alonso (1964) sets out to construct a general theory of land rent and, unlike the other models considered in this section, it is not devoted exclusively to residential property, although this still forms the primary focus. Alonso provides the most complete and general model of urban location theory and he succeeds in generalising von Thünen's central concept of bid rent curves to an urban context.

This model assumes urban space is continuous and one dimensional and that the only relevant dimension is distance from the centre. Alonso does not actually say why distance from the centre is important, but the presumption is that jobs and sales are located there (Mills 1972, at p. 67). In fact, this is a problem with von Thünen's original agricultural model: it simply assumes the existence of a central urban market with no further explanation.

Alonso's theory of the firm defines profit as total revenue minus the sum of land and non-land production costs. Revenue and non-land costs depend on quantity sold and on location. Land rent is exogenous to the firm but is dependent on location. Land cost equals land rent multiplied by the quantity of land demanded. The firm maximises profits with respect to quantity produced and location.

Both Wingo and Alonso explain patterns of location only in terms of *demand* for space and this assumption is modified by Muth (1969), who incorporates both supply and demand into his model of how the urban housing market operates.

Fujita (1990) builds on the work of these writers to provide a basic theory of urban land use and city size in a unified framework, again with the emphasis on residential property in the US. He includes the analysis of local public goods and neighbourhood externalities in his model.

In the UK, the work of Alan Evans (1972; 1973) is very important. Focused on residential property, Evans explains residential location decisions in the first British work of its kind.

These models result in a theoretical expectation that land prices will systematically vary within the urban area but, in practice, there is an observed difference between the prices that the models predict and the prices achieved in the market. Hedonic analysis seeks to explain these other factors influencing price using hedonic price functions, which were discussed at 2.3.

Wingo, Alonso, Muth, Evans and Fujita all make the neoclassical assumption of perfect competition, which is a basic assumption that underpins many theoretical analyses of property markets (see 2.6.3). All of them use the bid rent function approach and they also assume a city that is located on an isotropic or featureless plain, which is based on the original bid rent model introduced by von Thünen in 1826. This is the basis of the model adopted for the rent theory developed in the next section.

## 2.6 THE THEORY OF RENT AS A RESIDUAL

### 2.6.1 ELEMENTARY RENT MODEL

In *Location and Land Use*, Alonso (1964) demonstrates the relationship between location, land use and land values. The model presented here is adapted from this pioneering work and is used in a simplified form to illustrate

the residual nature of rent. The diagrams are based on the work of Launhardt (1993).

The following assumptions are made:

1. Only one commodity is produced and there are a large number of competing producers.

2. The city is monocentric and the market for all output is situated at one point in the centre of an isotropic plain.

3. There is a dense radial transport system. Transport costs are the only costs that vary for each producer and they are directly proportional to the distance from the centre.

4. Each producer requires the same level of profit and is possessed of all necessary knowledge to that end.

5. Producers rent land on an annual basis and the rent is open to re-negotiation at the end of each year.

6. All land parcels are identical and ready for productive use.

7. Tax rates are uniform, no local public goods are in evidence and there are no neighbourhood externalities.

Under these assumptions land values are a function of transport costs. See Figure 2.2a.

All costs and prices are measured per unit of output. The market price of output (p) and the cost of production (c), which includes an allowance for profit, are both fixed, irrespective of the distance from the market, whereas transport costs (t) vary with the distance from the market.

Total costs, (c + t) will rise until they equate to the market price of output, at a distance (d) from the market. Production beyond '$d_1$' is not profitable.

# ELEMENTARY RENT MODEL

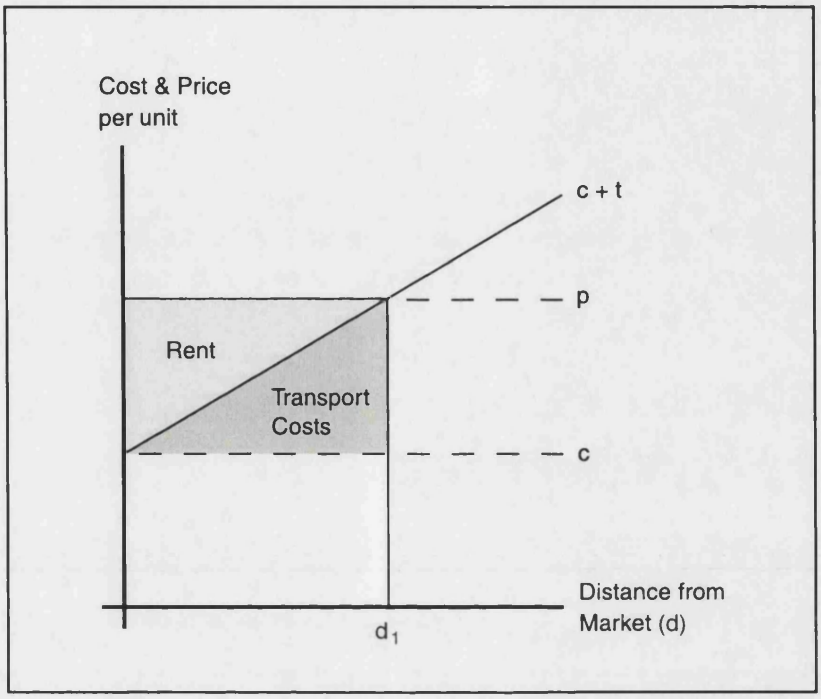



**Figure 2.2a: Land Values as a Function of Transport Costs**

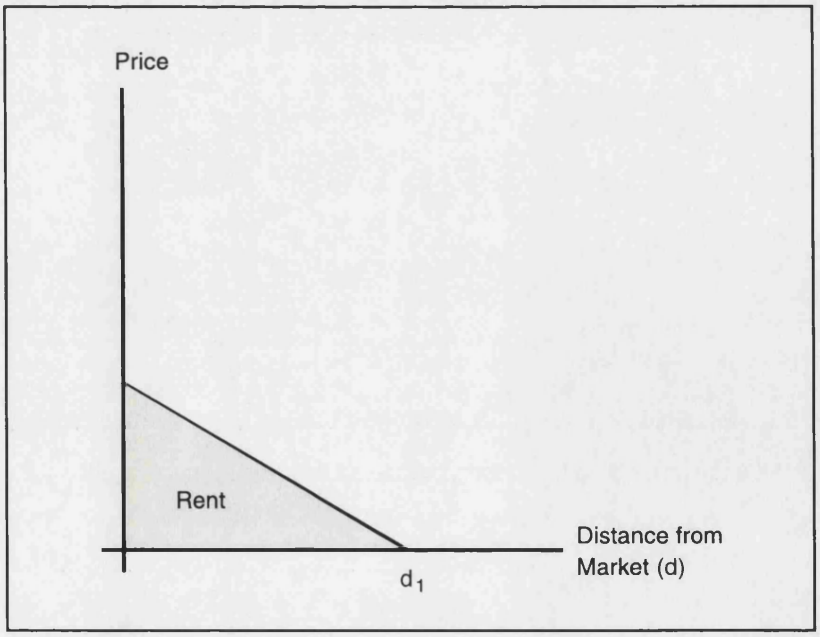



**Figure 2.2b: Surplus Rent of Land**

At '$d_1$' the residual rent accruing to the land is zero. At the market the residual rent is represented by the difference between market price and the costs of production (p – c). Between the market and '$d_1$', the residual available to pay rent diminishes as transport costs rise.

The rent at any given location can be expressed as:

$$r(d_j) = n [ p - c - t(d_j) ]$$

where

$r(d_j)$ = rent per unit of land at distance $d_j$ from the market

n = number of units of the commodity produced per unit of land

p = price per unit of the commodity at the market

c = cost of production per unit of the commodity

$t(d_j)$ = cost of transporting one unit of the commodity a distance $d_j$ to the market.

The residual rent of the land can be derived from Figure 2.2a and is shown separately in Figure 2.2b as a surplus. The surplus available can be seen to be an inverse function of distance from the market, resulting directly from the difference in transport costs.

If costs rise and this rise is not matched by a corresponding increase in the market price of the commodity, producers will adjust their rental bids to reflect the changed surplus. In this case the surplus will be reduced, but it could equally have risen, with existing producers being obliged to increase their rental bids if they are to maintain occupation of the land.

### 2.6.2 A LOOK AT THE ASSUMPTIONS

It is not intended to develop a more rigorous model of rent determination as a part of this thesis. Instead, the theory of rental value determination is explored in so far as is necessary to understand the impact of business rates on property values. The elementary model has been introduced to illustrate the important principle of rent as a residual or a surplus. The assumptions made earlier are not intended to be realistic and it is necessary to relax the

assumptions before the theory even begins to approximate to reality. A discussion of the more important relaxations takes place below.

The assumptions of a central market, an isotropic plain and a single proportionally varying cost are simplifying assumptions made for illustrative purposes.

The assumption of a single commodity precludes the possibility of more profitable land uses commanding the more expensive land. In a diversified market, where firms are in different businesses, there will be widely differing cost structures and levels of expertise, and the most profitable firms will gain the use of the land.

In a situation where there are a large number of competing producers, it is not likely that they will all have the same required level of profit. It is of great importance to note that the profits being considered here are prospective or expected profits, calculated by the land user before he takes occupation. These are target profits and, if a great deal of competition is anticipated for a particular property, then tenants will be prepared to consider lower target profits and the rent enjoyed by the land will be consequently higher.

From here on, it will be assumed that total costs always include a sufficient return to the land user in the form of profit to reward him for the risks involved in his business. Businesses are concerned with target profits and, when making a rental bid, they will make a calculation of costs, including their target profit, with the residual being the rent that can be paid. This is important because it shows how a prospective occupier will view the business rates payable on a particular unit before making a bid; as a tax payable by occupiers, business rates are factored into the total expected costs of property. This is also borne out by market practice, both in the statutory definition of rateable value, which excludes any tenants' rates or taxes, and also in rating valuation practice, where 'equation theory' is applied to the division of the residual between the rent and the rates. Emeny (1984 at p. 187) puts it like this:

> ...equation theory is based on the idea that a tenant is not ... concerned with the amount of rent he pays nor with the amount of

> rates he pays but ... with the combined figure of rent and rates. In other words if a tenant's rates increase he will want to pay less rent, whereas if they go down he would be prepared to pay more rent.

### 2.6.3 PROPERTY MARKET PERFECTION AND EFFICIENCY

The important assumption of a perfectly competitive market needs to be considered further. Evans (1995) examines the whole question of property market efficiency, stating (at p. 5) that 'most of the literature on the property market is written as though it were the very paradigm of a neoclassical perfect market'.

There are a number of characteristics of the property market that make it unlikely to conform to the model of the perfectly competitive markets used in micro-economics. The most important issue is the heterogeneous nature of property: it is not correct to assume that in every property market there is a single homogenous product, especially in small sub-markets. Likewise, within sub-markets, a large number of buyers and sellers and a high level of knowledge cannot be assumed. The complexity of diverse legal interests in property contributes to the problem. This leads to the conclusion that the property market is imperfect.

Many economic theories do not advance beyond the assumption of perfect competition and the Elementary Rent Model presented here is no exception. The conventional assumption of a perfectly competitive property market applies to the majority of the empirical work on tax incidence that is considered in Chapter 4 and it is an assumption underlying hedonic pricing techniques. For exceptions refer to the recent work of Oktem (2001) on the subject of property tax incidence under imperfect competition or Anderson et al. (2001), which is not specific to property tax.

A different but related aspect of market 'perfection' is the concept of market efficiency. Even if a market that cannot meet all of the economic requirements for market perfection, it can still be an *efficient market.* The Efficient Market Hypothesis (EMH) argues that the price of a share or other marketable security should accurately reflect all available information at any given time, and if it does, the market is efficient. Modern theories of market

efficiency have evolved from the work of Eugene Fama in the context of the stock market. Fama (1970) suggests three tests for efficiency: the weak test, the semi-strong test and the strong test. There is an extensive body of literature that develops Fama's concept of market efficiency and one thread of this literature has attempted to apply the theories of stock market efficiency to property markets. For a review of the applications of the EMH to property see Brown and Matysiak (2000 at pp. 431–462) or the earlier work of Brown (1991 at pp. 62–138).

However, it is submitted that property markets are not likely to be efficient in the instantaneous way envisaged by the EMH, particularly since the conditions for a perfect market are not even approximately fulfilled by property markets. Rather they are likely to offer what Alan Evans describes as 'efficiency over time' (1995 at p. 12). After reviewing the empirical evidence, Evans concludes that the property market is not efficient even in the weak form of Fama style market efficiency and the most recent work by Wang (2000) also confirms this finding.

Evans explores theoretically the idea that property markets are efficient in the long term. He puts forward a definition of efficiency that is appropriate to the property market and which takes account of the special characteristics of both property itself and the property market, including the institutional lease (see 2.6.5). This analysis includes location, market segmentation, infrequency of trading, and even the role of the agent in the operation of the market. He concludes that the property market is *relatively* inefficient when judged by the yardstick of stock market efficiency but that the property market in the long term can be treated as being 90 per cent efficient.

It is concluded that the property market offers a long-term efficiency that reflects the rational decisions of tenants and other occupiers. This 'efficiency over time' is necessary if the expected shifting of business rates into rents is to be successfully isolated but it implies the need for a long time frame in any empirical work that seeks to explore property tax impacts.

## 2.6.4 DEVELOPING THE THEORY

In seeking to explain the theory of rental value determination, Fraser (1993 at p. 169) asks three questions, each of which can be answered from the elementary model developed earlier.

1. What causes rent to be paid for the use of land?

   Rent will be paid for land when potential users consider that the revenue earning potential of the land exceeds all factor costs, including profit (but excluding the land itself).

2. What determines the amount of rent paid for the use of land?

   The amount of rent that will be paid for land can be viewed as the residual surplus expected from using the land in its most profitable use. The surplus referred to here is the residual that is left after deducting all costs, including an allowance for profit.

3. What causes rental value to change over time?

   Rental values will change over time if the expected surplus of revenue over costs of use changes. This may result from a change in the costs of produce from the land, from changed factor costs or from a combination of both.

It is Fraser's second two questions that are of special significance to this study. In answering these questions, the effect of the imposition of, or change in, a property tax on occupiers can be explained.

## 2.6.5 THE IMPACT OF THE UK INSTITUTIONAL LEASE

On the basis of the theory discussed so far, rental value is represented directly by the amount of the surplus after deducting costs.

One of the key assumptions was that the tenancy was for one year, following which it could be renegotiated. This renegotiation will reflect changes in the surplus that could be paid as rent.

In the UK, properties are actually occupied under a lease contract for a fixed term of years, with a term of 20 years or more being the market norm for institutional investment property before 1990, since when the trend has been towards shorter lease lengths (Crosby and Lizieri 1998).

Each year the tenant pays the amount of rent agreed under the lease. The lease will specify, *inter alia*, provisions for a periodic rent review, with the predominant rent review frequency in a modern lease being at five-yearly intervals (BPF/IPD 2002). In between rent reviews the rent paid under the lease is usually fixed. This is referred to as the contract rent or passing rent and this rent is reviewed as provided for in the lease at the date of rent review.

Figure 2.3 illustrates the relationship between contract rent, rental value and rent review. This relationship affects the way changes in rental value are transmitted to the rent payable by tenants in occupation.

In the case of a new letting, in a reasonably efficient property market, the contract rent and rental value will be the same at the time that the letting is agreed. Thereafter, depending on changes in rental values, the two may diverge. If the letting market is absolutely static, then no change will occur between contract rent and rental value but, if rental values increase after the contract rent is agreed, the contract rent will be lower than the rental value until the next rent review when the process of divergence may start again. Figure 2.3a illustrates this situation graphically.

It is common for the contract rent to be reviewed to full rental value at the rent review date, but there is often a provision for the review to be 'upward only'. This means that, if rental values have fallen since the contract rent was agreed, there would be no decrease in rent payable. This is described as 'a ratchet effect' by Baum (1989 at p. 75). In this case the contract rent would remain unchanged at rent review even if the rental value had fallen. This is illustrated graphically in Figure 2.3b.

# RELATIONSHIP OF RENTAL VALUE TO CONTRACT RENT

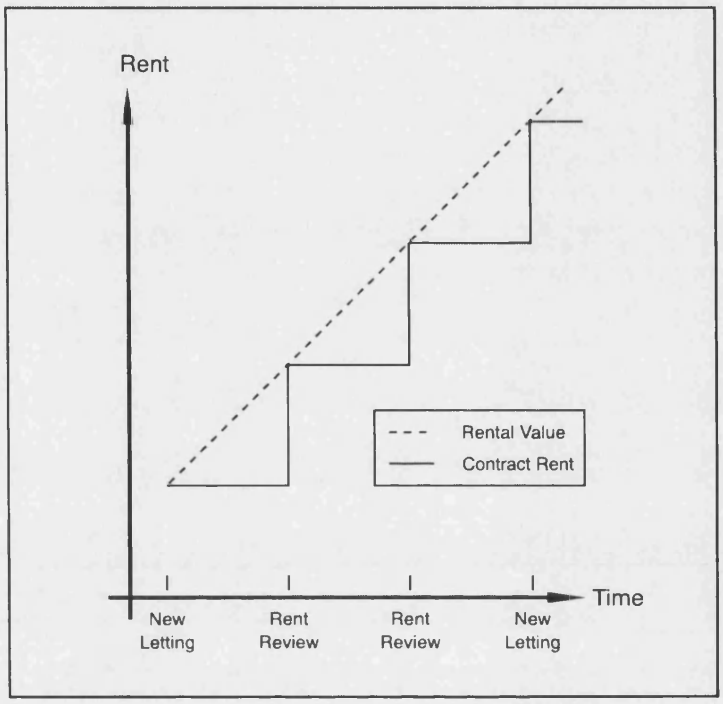



**Figure 2.3a: Relationship of Rental Value to Contract Rent**
Assuming Steady Rental Value Growth

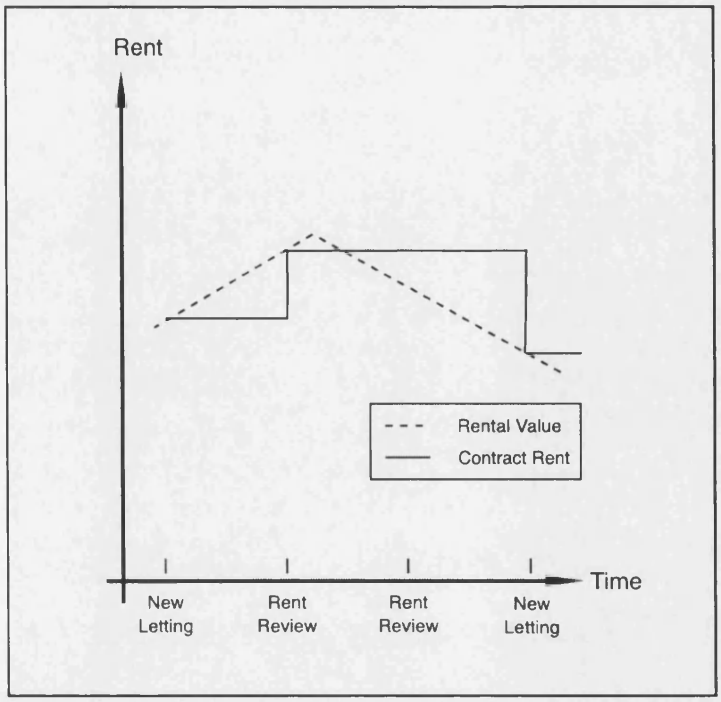



**Figure 2.3b : Relationship of Rental Value to Contract Rent**
Assuming a Fall in Rental Value

The lease represents a binding commitment for both parties for its duration. Only at the end of the lease (or a contractual break point) are the parties free to renegotiate terms, at which time the effect of any general fall in rental values could be passed on to the tenant.

The mechanism of rent review has some important implications for tenants, because they are not free to reduce their rents to reflect increased costs of operating. Under a lease with upward only rent reviews, and no break option for the tenant, no decrease in rent can be expected, even when the rent is reviewed. Only at the end of the lease will falls in rental value be passed on to the tenant and the length of leases makes such falls less likely. Even if rental values have faltered during the lease term, no reduction in rent would accrue to the tenant unless there was a sustained fall in values; this is one of the explanations for shorter leases in the early 1990s (Crosby and Murdoch 1998 at p. 6).

The periodic rent review, in a rising market, means that tenants are not faced with an annually increasing rent bill, and experience has shown that even a three-yearly review pattern is impractical, given the costs associated with agreeing the revised rent.

Given that rental bids are based on the expected profitability of operating a business from a property, the rent review pattern will have an influence on the tenant's rental bid. If inflation or income growth is expected to increase the surplus expected each year, rational tenants, in a competitive market, will increase their rental bid to reflect the higher surplus in the latter part of the rent review period. They might be expected to bid the average expected annual surplus for the whole of the rent review period. Baum and Crosby (1995 at p. 17) accept that rental values will reflect 'the fixed nature of the review period and are higher than their annual equivalent would be' but they go on to point out that 'there is no published empirical proof for this'. Even so, mathematical models of this 'uplift' have existed for many years (e.g. Rose 1979) and recent theoretical work has produced more complex stochastic models (see Ambrose et al. 2002).

The contractual rigidities introduced into the property market by the lease represent an externality and in other markets there have been several studies of this problem. See for example Ball (1987) or Taylor (1980).

The lease contract influences the way the price of occupation is set. For an open market letting, the rent is determined by the forces of demand and supply but, when the rent is reviewed to market value, the amount of the rent is settled by negotiation between the landlord and the tenant and the lease contract will specify a legal definition of market value. This will be based on a valuation (itself based on market values) but that is not the same as a transaction in the open market. Rent review and lease renewal evidence cannot be treated as a true market transaction (Crosby and Murdoch 2001 at p. 130). The difference between rental values from market transactions and rental valuations (that are based on a valuer's opinion of rental value) is important and it is discussed in Appendix 2. This thesis is concerned with rental value as determined in the letting market (the price) and, apart from careful discussion of the rental proxy used in this thesis for the empirical study, the distinction between rental value and rental valuation is not considered further.

### 2.6.6 THE IMPACT OF A RISE IN COSTS RELATIVE TO REVENUE

The concept of rent as a residual is central to the chief hypothesis of this research and it is useful to examine briefly the effects on the residual rent of changes in costs, such as changes in rate burden.

If revenues rise at the same rate as costs, the impact on rental values (viewed as a residual) will be neutral. If costs rise faster than revenue, the annual surplus can be expected to fall, but the contractual rigidities of the institutional lease mean that the changes in residual rent will not be immediate and the increased costs will not be reflected by an immediate fall in rent payable (at least for existing tenants). In times of rental value growth, increases in costs will tend to manifest themselves through a slower rate of rental value growth. This reduced rate of rental growth can be used to explain the long-term impact of business rates on rental values.

Appendix 3 illustrates and explains this situation, which can be described as a 'gearing effect'.

## 2.7 RENTAL VALUE – A DEMAND AND SUPPLY ANALYSIS

The model above shows the nature of rent as a residual, but the level of rent will be set by the interaction of demand and supply, as occupiers compete to take properties that will allow them to earn profits.

The work in 2.7 is based around the important contribution of Fraser (1986; 1993) and also draws on the work of Barlowe (1986) and DiPasquale and Wheaton (1996).

### 2.7.1 INDIVIDUAL PROPERTY LEVEL

The rental value of an individual property is determined by the occupation demand for it and, the greater the difference between a property's revenue earning potential and the factor costs involved in using it, the greater will be the occupation demand. This difference is referred to by Fraser as a property's 'revenue productivity'. He goes on to explain that the features of a property will affect its revenue productivity and the factor costs of use, which, in turn, will determine its rental value.

Features that affect an individual property's revenue productivity will include physical features such as design, layout and construction, but Fraser identifies location as being of dominant importance in explaining the demand for any urban property. Location is important in both a regional and a local context, and once built, 'property in areas of low demand cannot move physically to satisfy high demand in another location' (Fraser 1993 at p. 106).

The location of a property is critical to business premises, because it affects the transfer of goods, convenience for the labour force, customers and others. The movement of both people and goods is expensive and time consuming and accessibility is one of the most important factors in assessing the quality of location. A world where distance has little meaning, suggested by Cairncross (2001) since the advent of fast internet communications, is not supported by the empirical evidence (see for example Jones Lang LeSalle 2001). Transport is still of central importance in location decisions and the physical features of a property, combined with its location, will determine its revenue productivity, even in these days of internet communications.

### 2.7.2 AGGREGATE PROPERTY LEVEL

The property market has to be thought of as a number of interconnected sub-markets (Evans 1973), distinguished according to use, type, location, quality and size. The value of any individual property or subgroup of properties is determined by the forces of demand and supply acting in its own sub-market.

Occupation demand is dependent on the surplus that can be expected from carrying on business activity in that property. This surplus depends in turn on the demand for the goods or services that can be produced in that property, so that demand for property is determined by the level of demand for goods and services in the economy. This demand is affected by macro-economic variables, such as interest rates, the level of employment and the level of disposable income. Changes in real personal disposable income are a crucial determinant of aggregate occupation demand.

The general level of rental values is determined by the flows of occupation demand and supply of property to let, with rental values at any point in time being determined by demand from tenants seeking accommodation and the supply of floor-space being offered to let on the market (not the stock of property that exists in any one area). Stock of property may be significant in explaining long-term market supply but, in the short run, supply can vary independently of changes in stock.

Fraser (1986; and 1993, Chapter 15) gives a comprehensive treatment of the supply elasticity of business property which is used as the basis for the following discussion.

In the short run, both the new and existing elements of supply tend to be relatively inelastic. The supply of business property to let can be defined as the amount of space flowing onto the letting market at any point in time. It is made up of existing property being offered for re-let, new property being let for the first time and, to a lesser extent, owner occupier property being let for the first time. Existing property is a close substitute for new property of the same quality and these two elements of supply can be considered together for the purposes of this analysis.

The supply of new property onto the market at any point in time depends on development decisions that were made some time previously, sometimes years earlier. The amount of development activity depends on the expected profitability of development, which in turn is dependent on the expected difference between the value of the completed property and the total cost of development. In times of rising occupation demand, the volume of development activity tends to increase, leading, after a time lag, to an increase in new supply. The time period involved in development projects means that supply cannot respond immediately to changes in demand.

The supply of existing property to let is expected to be more stable than tenant demand, because the terms of the institutional lease will tend to increase the stability of supply (see 2.6.5 above). At any point in time, the supply of existing property available on the letting market will depend on the decision of tenants to vacate their premises on lease expiry. These decisions are influenced by the same factors that determine occupation demand. Decisions by occupiers to give up a lease and vacate a property depend on the tenant's expectations of future profitability, just like decisions to take up a lease in the first place. In times of anticipated profits growth tenants will not wish to vacate and supply will be constrained. On the other hand, in times of falling profitability, the supply of property to let can be expected to rise. Even if tenants cannot give up their lease until it expires they may be able to sublet their property and this will further increase supply at that time.

Rental value changes in the short term will tend to result from changes in occupation demand. This is due to the relatively stable supply of property to let compared with more changeable occupation demand.

In the medium term, both the new and existing components of supply in the letting market are much more elastic than in the short run and they tend to vary cyclically. In times of recession the supply of existing property to let will tend to increase as tenants exit the industry or otherwise reduce their demands for space. On the other hand, existing supply will tend to decline as businesses become more profitable when economic conditions improve. Increases in tenant demand are likely to result in more new development starts, but the supply of new property can only respond to increased demand after a time lag, represented by the development period. This lagged

response of new supply will vary with changing values and changing demand over the economic cycle.

The analysis of long-run supply elasticity for urban business property is complicated by the dual components of urban land. Buildings are essentially a manufactured product and their supply is elastic. The proportion of land to buildings that comprise a property will influence its supply elasticity and rental value. The proportion will vary according to property type, the location, building specification and the intensity of use.

## 2.8 RENTAL VALUE AND PROPERTY TYPE

The discussion below considers in turn the three types of property that are the subject of the empirical work contained in this thesis. In the past two decades technological and business changes have blurred the boundaries between these sectors, such that the property and locational requirements of high technology manufacturing firms, out-of-town retailers and service businesses seeking space can be very similar (Ball et al. 1998). The specific areas and property types selected for this thesis are not affected by this blurring of boundaries, except perhaps in the industrial area, where planning considerations are mentioned below. Otherwise, no further consideration is given to this issue. Again, the discussion is based around Fraser (1986; 1993) with additional reference to Lewis (1979).

### 2.8.1 INDUSTRIAL

The occupier of industrial property is most likely to be a business seeking to make a profit from occupation, but the link between rent as a residual and expected occupation costs is not as strong for industrial property as it is for retail. The link is clear for a small business operating from a single location but, where the occupier is a larger business with multiple branches, the profitability of one location cannot be measured in the same way. In the long run, the value of industrial property will tend to reflect building and development costs rather than profitability, but this relationship is closest when land availability is good (which is less likely to apply in established urban areas).

Modern industrial property is likely to be located on an estate. Industrial is taken to include factories, light industrial units, warehousing and distribution depots. Unlike retail property, the precise location is less critical with easier substitution between one industrial property and another. Except in specific contexts or sectors, few benefits arise for an industrial occupier being located in close proximity to other related businesses and there is less need for industrial occupiers to attract customers to their premises. This makes the precise location for industrial premises much less important than it is for shops or offices. The key factors that affect industrial occupiers are access to transport and the road network and proximity to a suitable workforce.

Planning policies in the UK have usually provided for an adequate supply of land with planning permission for industrial property but, in fully developed urban areas, which form the subject of this thesis, the scarcity of land (as a result of higher paying competing uses) and the inability to satisfy industrial demand by vertical development will result in a relatively inelastic supply of industrial property.

Changes in planning policy in 1987 and 1988 resulted in much more flexible zoning of different industrial users. Light industrial use was merged with offices under the Town & Country Planning Use Classes Order 1987, creating a new B1 use class. This was an amalgamation of the previous 1972 Use Class II (offices) and Class III (light industrial) and these changes resulted in greater effective supply for some uses, as changes of use became Permitted Development and did not require planning permission. The intention was to allow 'high-tech' occupiers to utilise their floor space more flexibly, overcoming a problem with the previous *sui generis* planning permissions, which tended to specify the proportion of a building that could be used for office (e.g. 20%) and the proportion that could be used for light industrial use (Fuller Peiser 1985).

In 1988 a new General Development Order introduced further flexibility. This allowed changes between the 1987 use classes B8 (storage and distribution) and B2 (general industry) to be treated as Permitted Development (for buildings under 235 $m^2$).

One consequence of these changes was a reduction in the overall supply of

industrial, light industrial and storage buildings: those that were suitable for office use could now be occupied as offices without the need for planning permission. Within a couple of years the majority of new B1 development that was carried out was built to full office specification (King & Co 1989).

Research commissioned by the Department of the Environment into the operation of the planning changes found that '... every site with a light or general industrial use or allocation is potentially an office location'. The report went on to state 'With the return from office space significantly greater than from other types of business space, then if the location is right it is office space that will be built' (Wooton Jeffreys Consultants and Bernard Thorpe 1991 at p. 21).

In this thesis industrial property is defined to include all of the industrial use classes, including B1. The blurring of the boundaries between office use within an industrial building and traditional office use does not affect the selection of properties for the industrial study, which is based on the location and physical design of the buildings.

### 2.8.2 RETAIL

Retail units are occupied by businesses who expect to make a profit from their occupation and the link between shop rents and the theory of rent as a residual is the strongest out of the three classes of urban property considered in this thesis. One reason for this is that the profitability can be judged at unit level, even for a multi-branch retailer.

The stock of town centre retail space is very inelastic even in the long run. It is worth noting that this inelasticity applies *within* a shopping area, but not *between* shopping centres; the overall stock of shops within a city will be much more elastic as a result of new development of both shopping centres and out-of-town retailing.

The inelasticity within an established urban shopping district arises because of the inability to increase the retail space and because of the crucial importance of location and even micro-location relative to pedestrian flow, and other determinants of prime pitch. For town centre shops it is typically not possible to satisfy demand in a given location by horizontal or vertical

development. Shops on one side of a street may have rental values substantially different from similar shops on the other. Even on the same side of the street, shop values can change dramatically within a few metres.

In a given town centre shopping area, demand by tenants is highest for retail space fronting the street (at street level) and that space cannot be significantly increased. This is known as Zone A space (see Baum et al. 1997 at p. 50) and is very inelastic. With an inelastic supply, shop values are primarily demand determined and demand will vary according to the spending power of the local population.

The planning changes of 1987 resulted in relaxations of retail uses, allowing more flexible changes between different types of use, without the need for planning permission. This created a new class of use, known as A1, which represented ordinary retail use and this is the type of shop that is considered in this work.

### 2.8.3 OFFICES

Offices are occupied by all types of tenants, not exclusively businesses. Possible office occupiers include local and national government, charities and other not-for-profit organisations. Business occupiers include professions, financial services and even manufacturing businesses. It can be seen that office-based activities serve all sectors of the economy and demand will reflect the general level of economic activity. The link between the profitability of occupying a particular office and the rent that can be paid is weaker for offices than it is for shops. Public sector occupiers have no link with residual profitability and the costs of a business headquarters building in London cannot be planned on the profitability of the administrative activities that take place in the building. Occupation demand and rental values will tend to follow a cyclical economic trend.

Compared to retail property, the stock of office property is much more elastic in the long run. Office demand can be met by building vertically and by transferring land from other urban uses, subject to the constraints of planning control. As with industrial property, one office property is easily substituted for another, and this will affect the elasticity of demand for office property.

This stock elasticity means that the supply side analysis is closer to that of industrial property and in the long run it is expected that values will show a close relationship with development cost. However, in Central London, where sites are scarce and office development is strictly controlled, values will be demand determined. Only in locations where supply is elastic can it be expected that values will have a close long-term link with development cost.

Office property is used to house people and carry out administrative functions. Location relative to other offices and to transport facilities for customers and staff makes the city centre the traditional location for offices, but traffic congestion and lack of car parking explain the trend to out-of-centre business parks.

The 1987 planning use of B1 applies to the offices selected for the empirical work, but the location and physical design of the buildings involved makes this an office study, even though the planning use is more flexible (B1 users also include light industrial use).

## 2.9 THE DETERMINATION OF FREEHOLD CAPITAL VALUES

Discussion in this chapter is primarily concerned with the determination of rental values but it is the goal of this thesis to examine tax capitalisation. Even though the tax is imposed on the occupier of the property, the burden is expected to be borne by the owner of the property (in the form of a reduction in capital value). This necessitates a brief look at the way in which rental values of business property are translated into capital values.

The actual price of an investment property is determined by the forces of demand and supply in the investment market (see Fraser 1993 Part II for a detailed explanation of the pricing of property investments). No consideration is given in this thesis to leasehold investment properties.

The capital value of any income-earning investment can be stated to be the present value of the expected future income flows from the investment. In the case of business property the income is represented by the rent. The investment price of a property is determined by the underlying income that will be received, from which it can be seen that any reduction in rental value

caused by the imposition of a property tax will result in a fall in capital values.

In this thesis it is assumed that the full amount of any reduction in rental value that is attributable to the tax will be fully capitalised into property values (see 3.6).

The magnitude of any tax capitalisation will be affected not only by the extent of any reduction in rental values caused by the tax but also by any effect that the tax has on investment yields. The UK property tax does not place an administrative burden on property investors (unless they are also owner occupiers) and the impact of the tax is expected to have an effect on investment income, making it less likely that investors would adjust their required yield.

The position may be different for taxes levied on the owner of a property, such as in the United States or if the political environment introduced uncertainty. In a climate of frequent and unpredictable changes in tax burden or a policy of tax change, for example, from occupiers onto property owners, investors may alter their required investment yield to reflect the expected consequences of the tax. Any actual yield change would take place through a process of market adjustment in the investment property market. Adjustments to investment yields as a result of the UK property tax are not considered further in this thesis.

## 2.10 CONCLUSIONS

Whilst there is disagreement amongst economists about the precise definition of land, especially in an urban context, there is a more general neglect of spatial economics in mainstream economic theory, which 'has confined itself to a wonderland of no spatial dimensions' (Isard 1956). This aspatial view is compounded by a failure to recognise the ownership interests in land, which Krugman (1995) identifies as a serious oversight when the role of economics in explaining activities in a capitalist economy is considered. (Turvey (1957) shows an unusual appreciation of the role played by different ownership interests).

There is, nevertheless, a large body of work by urban economists that

explains the way land values are determined, ranging from the early work of von Thünen (1826) in Germany, through to the pioneering urban analysis of Alonso (1964), Muth (1969), Mills (1972) and Evans (1973). More recent British contributions have been made by Fraser (1986; 1993), and Cheshire and Sheppard (1995; 1998).

The rent of a property can be viewed as the residual left after all costs are deducted and in a competitive market this rent will be determined by the forces of demand and supply, with location as the dominant influence on price.

Business rates in the UK will be capitalised if they impact on rental values. The precise effect of the property tax on rents will depend on several different factors: most importantly on the type of property; whether a short-, medium- or long-run analysis is made; general economic conditions; and equilibrium conditions in the local market.

Chapter 3 now considers the economics of property taxation, with the emphasis on tax capitalisation.

# CHAPTER 3

# THE ECONOMICS OF PROPERTY TAXATION

## 3.1 INTRODUCTION

This chapter examines the economics of the property tax, with particular reference to the United Kingdom, where the tax is known as business rates and is used for the finance of local government. Appendix 1 gives an overview of the legal framework of business rates.

The chapter reviews the economic principles of taxation, including the benefit principle and the ability to pay principle and then goes on to consider developments in the economic analysis of tax incidence. A straightforward model of tax capitalisation is explained.

A discussion of the theoretical developments is made with the emphasis on the three 'views' of the property tax that have emerged over the past 30 years.

No lengthy analysis is made in this thesis of the large areas of public sector economics that are concerned with the rationale of the modern state, the analysis of public goods, public choice and welfare economics; coverage of these topics is given in any of the standard texts (see for example Musgrave and Musgrave 1989).

Table 1.1 set out the OECD Classification of Taxes and it is worth reiterating here that this thesis is concerned only with OECD Class 5220: recurrent taxes on immovable property that are paid by enterprises. The history of other (non-recurrent) taxes on urban property is long and notorious (see Prest 1981), but these taxes are not considered in this thesis.

## 3.2 INTERNATIONAL PERSPECTIVE

Property taxes, that is, taxes on land and buildings, have long formed an important part of government revenues in many countries throughout the world, but the mechanics of the tax vary from country to country.

A report on taxes on immovable property within member countries was prepared by the OECD (1983) and a comparative review by McCluskey (1999b) provides a more recent and comprehensive coverage of property tax systems in 21 countries, 14 of which are outside the OECD membership.

The common feature is that the tax base is always assessed by reference to the value of real or immovable property and there are two principal alternative methods adopted for defining the tax base around the world: the tax is based either on the rental value of property or on the capital value of property.

In the UK the tax base is assessed by reference to rental values of properties, whilst in the United States it tends to be assessed by reference to capital values. In the US both tax base and tax rate are set locally, whilst in the UK the tax base has long been assessed centrally and the same tax base applied to all local authorities. In the UK the tax base is periodically reassessed on a national basis. In the US, assessment is by jurisdiction and it is unusual for wholesale reassessment of the tax base in any particular administrative area.

A further important difference in practice between the UK and the US is that the legal incidence of the property tax in the US falls on the building owner, whereas in the UK it falls on the building occupier.

Administrative issues also play a part, affecting the scale of the analysis. Following successive reorganisations of local government boundaries in the UK (see 5.2.1), there were fewer than 500 separate local authorities in 1998 with power to levy a rate. Contrast this with the US where, in 1997, there were 39,000 separate governments with authority to impose a property tax (OECD 1997b). Another, more important, difference in the US is the prospect of overlapping tax jurisdictions, which does not exist in the UK, even allowing for rate precepting by higher level authorities (rate precepts are explained in A1.3.4).

In many countries, especially those that are federally organised, there are significant differences in both the tax base and the tax rate between different jurisdictions. Until 1990 local authorities in the Britain set their own tax rate,

which resulted in wide differences in the tax burden between jurisdictions and this facet of the UK system is used in the empirical study carried out as part of this work.

In nearly all systems there are exemptions and reliefs from the tax (Youngman and Malme 1994), for example, religious bodies and charities in many countries and in the UK for the whole agricultural sector.

## 3.3 PRINCIPLES OF TAXATION

In 1776, Adam Smith (Smith 1776) set out four canons of taxation: *equity*, *certainty*, *convenience* and *efficiency*. When measured against these criteria, property taxes can easily comply with the requirement for certainty and convenience. The difficulties arise with the question of equity and efficiency.

In dealing with equity, there are two questions that need to be considered:

Who bears the burden?

Is the tax fair?

The first question is absolutely central to this work and is considered in detail in 3.4. The second question is also reviewed but in less detail in 3.3.3.

Dealing with efficiency and recasting it in the modern language of public finance, the tax burdens related to efficiency can be classified into two categories (James and Nobes 2000), the excess burden of the tax and costs of the tax, both administrative and compliance.

### 3.3.1 EXCESS BURDEN

It is to be hoped that the overall burden of taxation will be more than offset by the benefits to society and the economy from the resultant government activity. But taxes are compulsory and, given the lack of choice by taxpayers, the levying of a tax may alter economic activity. This is called the excess burden or deadweight loss. The excess burden of taxation can be defined to

mean the reduction in economic efficiency that is introduced by and attributable to the tax system.

Income and substitution effects can be distinguished as part of the excess burden. As the taxpayer's income is reduced by the imposition of the tax, spending power is reduced and there is a transfer of resources between the taxpayer sector and the public sector. The substitution effect arises when relative prices are affected by the tax and this results in substitutions of one form of consumption for another.

Excess burden tends to be analysed as part of the tax incidence in an analysis that can take place at several different levels. One analytical device that is often used to examine the excess burden at a theoretical level is the imposition of a specific tax on a single commodity (see James and Nobes 2000 at p. 23 for an example of this analysis).

### 3.3.2 ADMINISTRATIVE AND COMPLIANCE COSTS

The costs of running the tax system can be ascribed to the heading of administrative costs if they are borne by the public sector and as compliance costs if they are borne by the private sector. Those features of a tax that impose costs on one sector also tend to impose costs on the other (James and Nobes 2000 at p. 38).

The degree of complexity is the single most important feature that influences these costs and this will tend to influence costs on both sectors in the same direction. After complexity, the most obvious other factors that determine the administrative and compliance costs are the amount of work required to determine liability and the frequency of payment.

Administrative and compliance costs for the UK property tax are relatively low and this has always been one of the advantages of the tax.

### 3.3.3 IS THE TAX 'FAIR'?

Everyone can agree that taxes should be fair, but there the consensus stops. Over a period of 200 years two alternative equitable principles of taxation emerge from the literature: the *benefit principle* and the *ability to pay principle* (Brown and Jackson 1990 at p. 299). The benefit principle is an attempt to assess the basis of taxation on how much benefit is received by the taxpayer from the expenditure, whilst the ability to pay principle is based on how much a taxpayer can afford to pay.

The original rationale of business rates was as a benefit tax used to pay for local services and today the tax is still used for this purpose. The problem is that, as the breadth of local services has increased and the size of local authority administrative areas in the UK has grown, the attributable benefits become more remote from the taxpayer. This is especially true since the introduction of the Uniform Business Rate in the UK with the tax revenue being pooled and redistributed by central government (see A1.4)

### 3.3.4 BENEFIT TAXES

A *general benefit tax* would operate on the principle that taxes are paid in direct return for the benefits received. The benefit principle likens the tax system to the market system and in its most pure form it considers taxes as a voluntary payment for public goods. This is a big departure from the true position, taxes being compulsory and non elective.

A further difficulty arises in the analysis of who benefits most from the consumption of public goods, especially pure public goods, such as defence, which are both non-rival and non-excludable (see Samuelson 1954).

Furthermore, the benefit principle cannot be applied to the redistributive function of government as defined by Musgrave and Musgrave (1989). This is considered to be a significant flaw in the benefit principle, because it cannot be applied to expenditures that are designed to be straight redistributions, such as Income Support or Working Families Tax Credit.

Benefit taxes are attractive to economists because they necessarily take account of both the raising of the revenue and the expenditures made by government. But a general benefit tax is only of theoretical interest and it will not be considered further.

The alternative to general benefit taxes is a *specific benefit tax*. Such taxes are more feasible and are encountered in practice in several cases, such as television licence fees and planning fees, which are really 'user charges'. For a benefit tax to be truly specific, the funds collected should be earmarked and allocated to the expenditure concerned, a technique known as tax hypothecation. The UK Treasury does not maintain a separate 'pot' for any individual taxes, with the exception of National Insurance contributions. Names like 'Road Fund Licence' for vehicle taxes suggest a separate earmarked fund but, since 1937, the vehicle licence fees have been used for general purposes.

Since 1990, business rates have been collected by local authorities and paid into a central pool for redistribution according to population (see A1.4). This does not make it a benefit tax in the sense being discussed here. In fact, it removes doubt about the relationship of the tax (paid by business) and the benefit (distributed according to the residential population).

The Water Rate, a close relative of the Business Rate, was an example of a specific benefit tax, which existed until privatisation of the water industry in 1989.

### 3.3.5 THE ABILITY TO PAY PRINCIPLE

This is today the generally accepted principle of distributing the tax burden. The ability to pay principle has its foundations in the writings of Adam Smith (1776) and John Stuart Mill (1848), although Smith advocated both the ability to pay and the benefit principles at different times.

The main debate about this principle is how to measure the ability to pay. Much has been written on the subject and the Meade Committee (1978)

gives a comprehensive review of the alternatives, as does Kaldor (1965) in his famous proposal for an expenditure tax.

Property taxes, whether based on capital or rental values, are loosely related to the ability to pay. An occupier of a large or expensive property is, on the face of it, more able to pay higher tax. There is also the benefit principle argument that the taxpayer will use more local services. The difficulty arises when the tax base is unrelated to the actual ability to pay the tax today. This can arise for a number of different reasons. Where the tax is based on capital values, the occupation of a large, expensive office building in a city centre does not necessarily imply an ability to pay high taxes out of current income. Changing patterns of value in the urban area can result in anomalies and in the UK the infrequent reassessment of the tax base has allowed such inequalities to remain in place with a resulting loss of confidence in the rating system (see for example Birdseye and Webb 1984).

The relationship between occupation of a property and the profitability of a business requires consideration. If a business has low or even no profits, the tax burden can be crippling. This is known as *tax exhaustion* and can be a significant problem for new businesses and start ups, as well as firms in positions of marginal profitability. One feature of the UK property tax is its deductibility from profits as an allowable expense against the central government taxation. This reduces the average rate for the combined tax burden on the business but the benefit of central deductibility is of no use to a tax-exhausted firm. It could be argued that occupation of property without the ability to pay the costs is a signal of misallocated physical resources. On the other hand, occupation of a property is a long-term commitment, influenced by the contractual rigidities of the institutional lease and business profitability is a residual with profits varying from year to year according to prevailing business conditions.

That it does not conform to the ability to pay principle has been a major criticism of the property tax (see for example Becker 1969; or in the UK Plimmer et al. 2000). This means that the tax is regressive in terms of income, with the average tax rate falling as income rises. For a progressive

tax, the average tax rate should rise as income rises; this criticism is at least partly caused by the irregular revaluations of the tax base in the UK.

### 3.3.6 HORIZONTAL EQUITY

Due and Friedlaender (1981 at p. 234) identify the concept of *horizontal equity* – that those with equivalent circumstances should be treated equally.

Horizontal equity is most frequently compromised when administrative arrangements are unsatisfactory (Kay and King 1990 at p. 41). For the UK property tax in the period 1979–1990, horizontal equity was seriously compromised. It was possible for two occupiers of identical properties in adjacent administrative areas to pay vastly differing amounts of business rates, depending on the tax rate applied by the local authority.

Of course, if each received different services in exchange for the tax, then this may not have been so serious. In this case the benefit principle might be applicable and it would mean that horizontal equity was maintained. In Chapter 5 it is suggested that any additional benefits that are provided in high tax areas, flow to the residential sector and give few, if any, benefits for businesses. For the preservation of horizontal equity it is important that these benefits are attributable at least loosely to the taxpayer and not simply redistributed at local level to others in the jurisdiction.

Administrative fairness is another measure of the horizontal equity in a tax: it can clearly be argued that a tax system that allows identical neighbouring properties to be taxed at a greatly different level is a breach of this principle, again unless the benefits derived are demonstrably different.

## 3.4 TAX INCIDENCE

It is the issue of tax incidence, sometimes known as the distributional burden, that is the main subject of this thesis. The goal in analysing tax incidence is to understand and identify the tax impacts on entities other than the taxpayers themselves. The central question in its classic form is 'Who bears the burden of the property tax?', and answers to this question are

important, because they help explain how the property tax affects owners and occupiers of property, as well as property markets themselves.

Five possible tax impacts were identified in Chapter 1 from the point of view of businesses.

1. Influence on overall profitability.
2. Influence on investment.
3. Influence on reinvestment.
4. Influence on choice of factors.
5. Influence on other economic entities through tax shifting.

These points are interrelated and the impact of the tax is both complex and difficult to analyse effectively. Simple models require unrealistic assumptions. Complex models can be unmanageable and the results impossible to test empirically.

The influence of the tax on other economic entities will depend on a number of issues, two of the most important being the mobility of labour and the degree to which the firm's goods are locally consumed. The labour mobility will influence the extent of any *wage effect*, with immobile labour potentially bearing the impact of the tax in the form of lower total employment costs. That is, firms will employ fewer people rather than make an absolute cut in wages paid. *Price effects* may arise if the market for the firm's goods is concentrated locally and the firm enjoys an element of monopoly. If not, and the goods are sold nationally or internationally in competitive markets, the tax may be shifted back to owners of capital, showing a *capital effect*, either in the form of reduced profits or in the form of reduced rents and thus lower capital values for property.

There are two basic approaches to the analysis of tax incidence. The partial equilibrium analysis is the traditional approach developed by Alfred Marshall and central to neo-classical economics. A partial equilibrium analysis is used to identify the initial impacts of a tax and at a theoretical level it is based on the assumption that all other commodity and factor prices remain unchanged. This obviously does not reflect all impacts of the tax analysis,

which will depend on how the economy as a whole responds to the imposition of the tax and it is to address this weakness that a general or full equilibrium analysis is carried out.

A number of attempts have been made at a general equilibrium analysis over the years and the model that is now most generally accepted is the Harberger model (Harberger 1962), with modifications for the property tax by Mieszkowski (1967; 1969) and McLure (1971; 1975). McLure and Thirsk (1975) give an excellent graphical exposition of Harberger's model. After a series of simplifying assumptions, the Harberger model makes the analysis in terms of two factors of production and two goods or sectors and for this reason it is often known as the 'two sector general equilibrium model'. Other assumptions include perfectly inelastic supply of factors, perfect competition and a starting position of Pareto-efficient allocation before the tax is imposed. This last assumption underlies nearly all tax incidence analyses.

### 3.4.1 FORMAL INCIDENCE

Formal incidence is easy to establish, referring to the person or organisation (the taxed entity) who is legally obliged to pay the tax. In the case of the UK property tax, it is the occupier of the property.

### 3.4.2 ECONOMIC INCIDENCE

The identification of economic incidence requires an analysis of the extent of tax shifting, as well as the excess burden imposed by the tax. Property taxes can be shifted, either forwards – through increased prices, or backwards – through reduced payments to suppliers or factors of production such as labour or property. These are the price, wage and capital effects referred to at the beginning of this section.

The burden of the tax could of course remain with the occupier, in which case the legal incidence and the economic incidence might appear to be the same. Even then, the effect of the tax would be to reduce profits, which

might be borne by shareholders and capitalised in the form of lower share prices.

A more rigorous analysis of this initial incidence can be made by assessing effective tax rates on the taxed entity and this approach can be used to identify the *fiscal wedge* that exists between pre-tax and post-tax rates of return (Bennett and Krebs 1988). The fiscal wedge is a measure of the distortion introduced by the tax system (the model of tax incidence at 3.5 also depicts the fiscal wedge).

Because there may be several intermediate bearers of the economic incidence before the final incidence of the tax is identified, economic incidence can be analysed at different levels. Final incidence analyses include an assessment of the full effects of the tax on the economy as a whole and this would require a general equilibrium analysis of taxation. Any analysis that does not seek to identify the full effects of a tax on the economy would be a partial equilibrium analysis and it is this level of analysis that is contemplated in this thesis.

Many incidence studies have dealt with local taxes in isolation from the benefits that arise, but the extent to which businesses benefit from local taxes is important. The whole problem of tax incidence comes about when tax and benefits do not match, and local property taxes on businesses in the UK can be seen as being only partially offset by the benefits. This may give rise to further incidence effects between businesses in high-tax areas and those in low-tax areas, if there is a greater benefit offset for one or other (as a proportion of tax paid).

Marshall (1890 at p. 794) identifies onerous rates as those where no compensating benefit is given to the person who pays them and beneficial rates as those that provide benefits for the taxpayer and which can be provided more cheaply by the local authority than any other way.

Another important part of this question relates to the relative share of the tax base composed by the business and residential sectors. Where the relative levels of service do not match the relative share of the tax base, the local authority action can be seen as redistributive (see 5.5.2).

Finally, there may be uneven impacts, depending on how the tax is defined. Just as a payroll tax will bear disproportionately on labour-intensive businesses, so a property tax will be a greater burden on property-intensive businesses (disregarding the possibility of tax shifting). This has traditionally been seen as bearing most heavily on industry with its high property needs and rating assessments that include plant and machinery. As the industrial sector contracted during the 1970s this has changed and more recent figures suggest that industrial users spend on average 4.3% of their overheads on business rates compared to retailers, who spend 6.7% of their overheads on business rates (DOE 1995a at p. 39).

## 3.5 A MODEL OF TAX INCIDENCE

The most influential body of literature on tax incidence is cast in terms of a neoclassical economic framework and can together be taken as the *modern neoclassical incidence theory.*

The economic analysis of tax impacts under perfect competition is well established and a model of tax incidence is now developed from the perspective of the UK business rates, which are paid by the occupier.

This is an analysis of tax shifting effects between occupier and landlord (or building owner). There are other ways in which the occupier could shift the tax, both backwards or forwards, and these have already been discussed (see 3.4).

It should be noted that, for an analysis of incidence, it makes no difference whether the tax is imposed on occupiers or landlords. It is the relative price elasticities of demand and supply that determine the tax incidence.

For any analysis with tax, there will always be two prices in the system, the demand price and the supply price. The difference between the supply price and the demand price is described as a 'fiscal wedge' (King and Fullerton 1984) and it was used by Bennett and Krebs (1988) in their macro-level analysis of UK property tax incidence and latterly by Bond et al. (1996a) in a micro-level analysis of tax incidence (see Chapter 4).

The following analysis is based on the standard micro-economic model of tax incidence (Varian 1992 at pp. 228–230; Stiglitz 1999 at pp. 490–493; Varian 2003 at pp. 294–300). The figures are adapted from Stiglitz.

The demand price is the price paid by the occupier and the supply price is the price received by the landlord. The demand price and the supply price will differ by the amount of the tax:

$$p_s = p_d - t \qquad (1)$$

where

$p_s$ = supply price
$p_d$ = demand price
$t$ = the amount of the tax

The price paid by the occupier is less than the price received by the landlord by the amount of the tax. The behaviour of the occupier and of the landlord will depend on the price faced. The equilibrium condition is that demand equals supply:

$$D(p_d) = S(p_s) \qquad (2)$$

where

D = Demand
S = Supply

Combining equation 1 and equation 2 gives either:

$$D(p_d) = S(p_d - t) \qquad (3)$$

or

$$D(p_s + t) = S(p_s) \qquad (4)$$

Equation 3 represents the position if the tax is paid by the occupier but the solution for $p_d$ or $p_s$ is independent of whether equation 3 or equation 4 is solved. The amount by which the demand price falls (the extent to which the landlord will bear the tax) depends on the slope of the demand and supply curves. The flatter the demand curve or the steeper the supply curve, the more tax will be borne by landlords. The steeper the demand curve or the flatter the supply curve, the more tax will be paid by occupiers.

The effective tax incidence will depend on the elasticity of demand ($\varepsilon d$) relative to the elasticity of supply ($\varepsilon s$).

The situation is shown graphically in Figure 3.1 and Figure 3.2. Because there are two prices in the system, the effects of the tax can be shown either as a downward shift in the demand curve or as an upward shift in the supply curve: the figures follow the convention discussed by Hirshleifer (1997 at p. 39) of interpreting the tax as an 'add-on' amount and depicting only the supply curve shifts (against the demand price).

Figure 3.1 illustrates the position when the tax is borne entirely by the occupier. Figure 3.1a shows the case of a perfectly elastic supply curve ($\varepsilon s = \infty$). The price rises by the full amount of the tax and the tax burden falls on the occupier. Figure 3.1b illustrates the case of a perfectly inelastic demand curve ($\varepsilon d = 0$). The quantity demanded will not alter in response to a change in price and again the tax burden falls entirely on the occupier.

Figure 3.2 shows the position when the tax is borne by the landlord (who receives $P_0 - t$). Figure 3.2a shows the case of a perfectly inelastic supply curve ($\varepsilon s = 0$). The same supply curve applies both before and after a change in the tax (the supply curve shifts along itself) and price does not rise at all: the tax is shifted to the landlord. Figure 3.2b illustrates the case of a perfectly elastic demand curve ($\varepsilon d = \infty$). The demand price falls by the full amount of the tax and the landlord will bear the entire tax burden. For business rates, this represents a 100% shift from the occupier, who bears the legal incidence, and it translates to 100% capitalisation.

The polar demand and supply conditions shown in Figures 3.1 and 3.2 are extremes. Increases in the tax will result in a combination of price effects: an increased price payable by the occupier and a reduced price receivable by the landlord. This will be influenced by the time scale of the analysis because the respective elasticities are likely to vary between the short-run and the long-run supply and they also will depend on the degree of factor substitution that is possible.

The importance of the relative elasticity of both supply and demand is clearly shown by the model of tax incidence set out in this section.

# ELASTICITY OF DEMAND AND SUPPLY
## Tax Borne by Occupiers

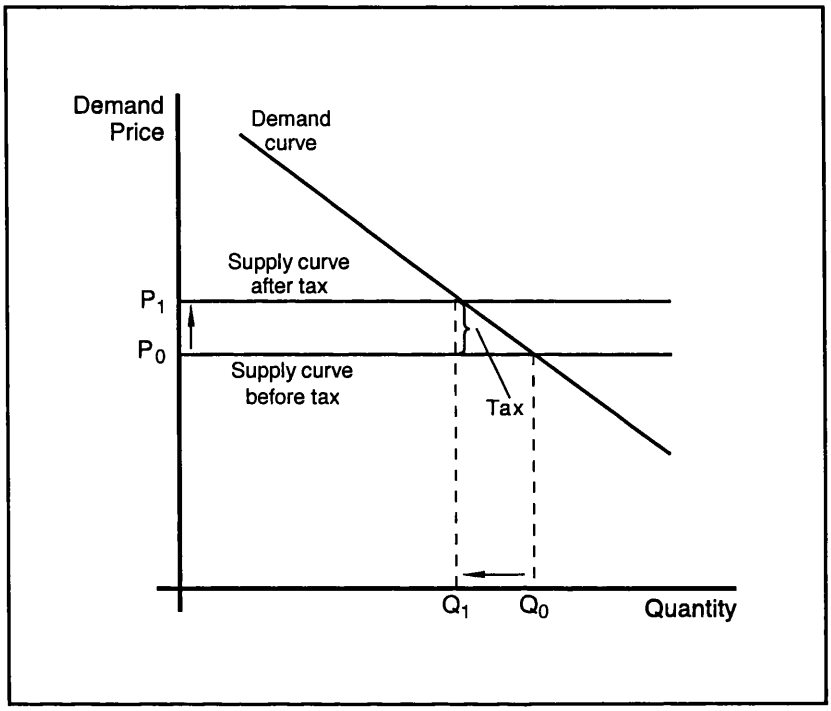



**Figure 3.1a: Perfectly Elastic Supply Curve**

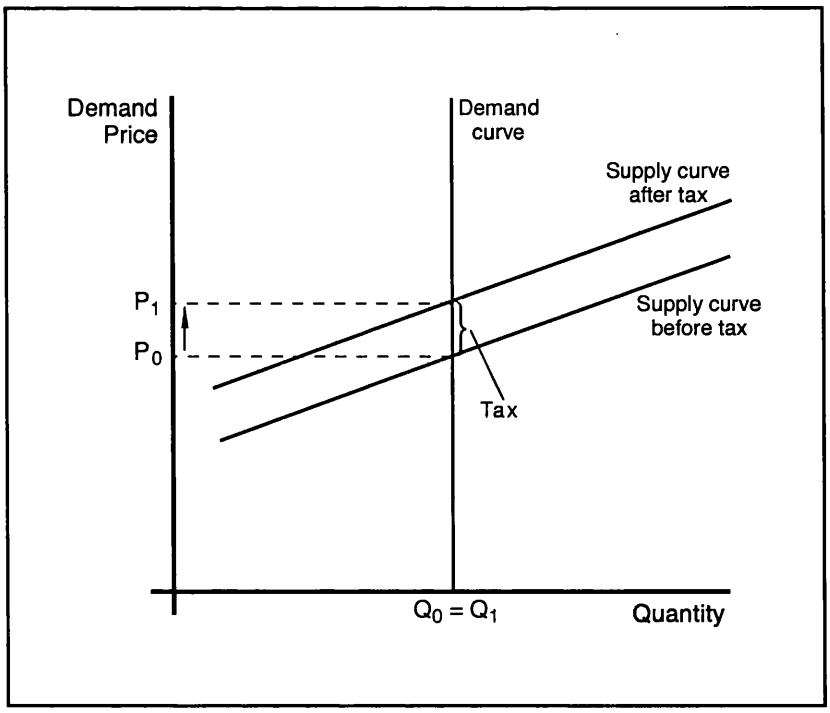



**Figure 3.1b: Perfectly Inelastic Demand Curve**

# ELASTICITY OF DEMAND AND SUPPLY
## Tax Borne by Landlords

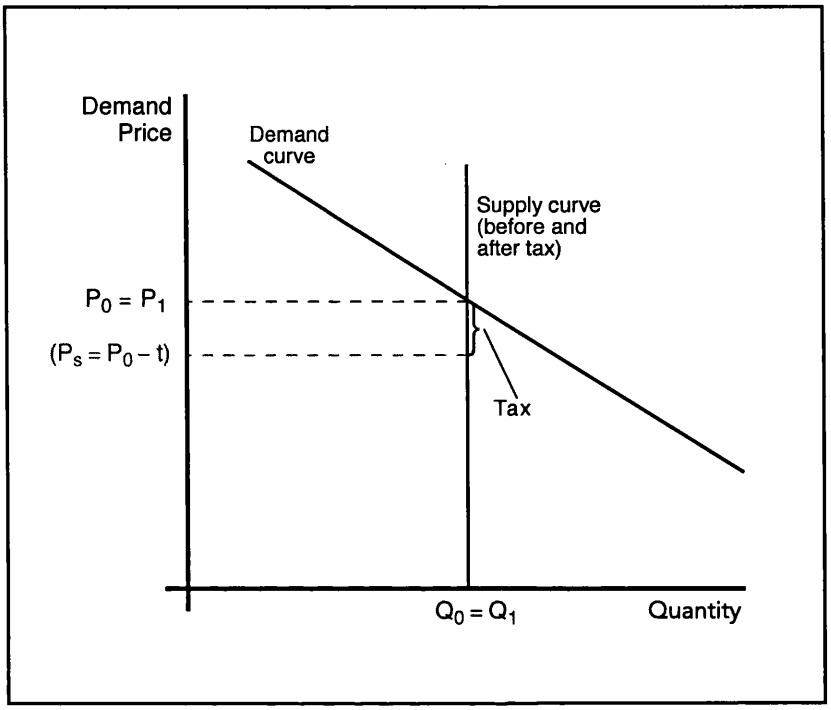



**Figure 3.2a: Perfectly Inelastic Supply Curve**

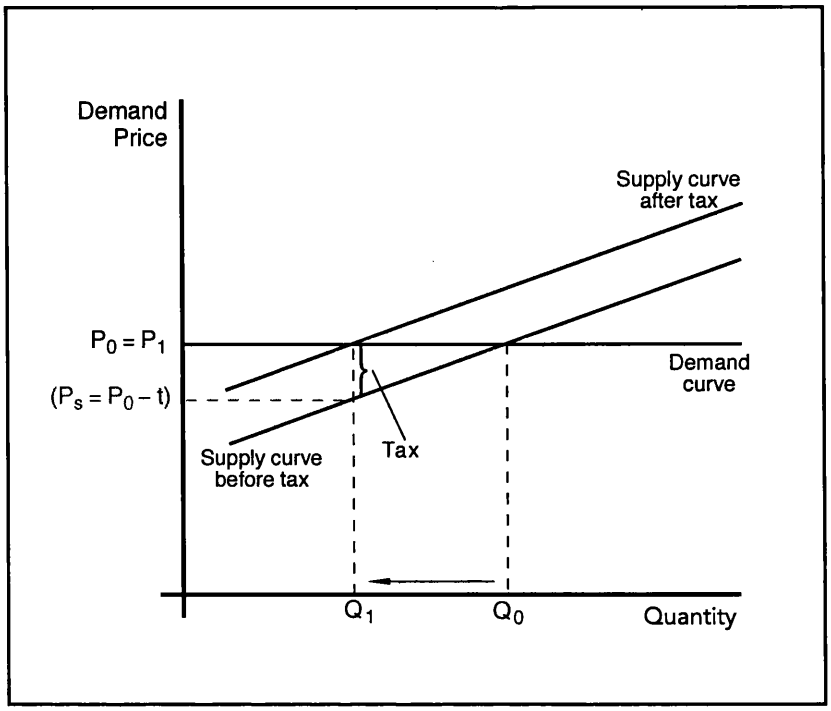



**Figure 3.2b: Perfectly Elastic Demand Curve**

## 3.6 TAX CAPITALISATION

The incidence of property tax has always been a controversial topic and much of the debate centres around tax capitalisation, which is occasionally known as the generational burden of the tax.

*Tax capitalisation* describes the effect on the market price of an asset caused by the impact of the tax on the expected return from that asset. If the income from an asset is reduced by the imposition of the tax, this reduction will be capitalised (resulting in lower capital values). See James and Nobes (2000 at pp. 88–89) for a contemporary discussion of tax capitalisation in the UK context. In this thesis, any reduction in rental value caused by the imposition of a property tax is treated as causing a corresponding reduction in capital value.

The model set out in the previous section explained the way in which tax incidence will impact on the owner and occupier of a property. Whether a business property is rented or owner occupied, the capital value is a function of the expected rental income (see 2.9). If the tax is capitalised, this will be reflected by a reduction in the capital value of the property. The UK tax is paid by the occupier of the building. If the tax is paid by a tenant who is renting the building and the tenant reduces the amount of his rental bid by the amount of the tax (as explained in 2.6) the rental income will fall. If the tax is paid by a building owner who is in occupation then it will be a direct cost or a deduction from the notional rental value. In principle, therefore, where there are no offsetting benefits, the tax will be capitalised into the value of the building, resulting in a capital loss to the owner.

A theoretical assessment of the way business rates might impact on investment property in the UK was made by Fraser (1985), who used the popular device of assuming a total abolition of the tax (see for example Turvey 1957 at p. 68 or Harvey 1992 at p. 378 who both employ a similar assumption). Fraser assumes that the business rates are abolished *in toto* without any replacement tax and without any impact on public expenditures. He then examines the effect on property values and rents in such a situation, considering each type of property separately. The conclusion is that rent

(and therefore property values) will rise, the extent of this depending on market conditions at the time and the relative supply elasticity of the particular property type (see 2.8).

If tax capitalisation takes place, it will introduce a distortion into the property market between investors and occupiers, as well as between different types of occupiers, such as leasehold occupiers and owner occupiers (Bennett and Krebs 1988 at p. 25). Taking the case of owner occupiers and assuming the tax is shifted backwards, the tax capitalisation is reflected in lower capital values, resulting from lower rental growth and possible distortions to the investment yield (see 2.9). Tenants under an occupational lease do not suffer in this way.

It has been argued that, if complete capitalisation of the tax (less the value of expected benefits) takes place, then the impact of the tax on business is zero. This fallacy was long ago identified as being based on a partial and inadequate analysis (Adams 1916). Bennett and Krebs (1988 at p. 24) observe that the question of business tax impacts will seem to disappear if a business can shift the whole of its tax burdens to other entities. This is only correct when viewed from the perspective of the taxed entity or the bearer of the legal incidence. The tax impact is simply shifted elsewhere and so it cannot in any real sense be considered to have disappeared.

The consequences for the entity bearing the economic incidence can vary. In the case of a backward shift to owners of capital, the returns are reduced. In an environment of rapid or uncertain tax changes, the dynamics of capitalisation will be affected and there is scope for windfall gains (or losses) by the present owners of the asset. This can be controlled to some extent if the changes are government inspired, through the use of 'rate capping' (see 5.5) or safety nets where there is a general shift of burdens following legislation (Bennett and Krebs 1988). Transitional relief under the uniform business rate is one example of such a safety net.

Finally, there is the question of the time frame within which capitalisation might take place. Contractual or other rigidities in factor supply and demand will influence the extent and speed of capitalisation. The mechanics of the UK property markets could result in a significant lag before tax changes can

be capitalised, causing a different impact between the short-, medium- and long-term capitalisation effects of the tax (see 2.6.5 above).

## 3.7 MODERN NEOCLASSICAL INCIDENCE THEORY

Numerous reviews of the theory have been written over the years. More recent examples include a summary by Oates (2001); a British review by Mair (1991); and a comprehensive survey by Mieszkowski and Zodrow (1989).

As early as 1890, Alfred Marshall (1890 Appendix G) provided a substantial discussion of incidence of local rates. He discusses the difference between a uniform national property tax and 'high onerous local rates' and concludes that such rates will be shifted onto owners. Marshall sees 'onerous rates in one district as a bounty to ... landlords in other [districts]' and similar conclusions were reached by Chorlton (1907). In the US, Brown (1924) found that the tax would be borne by owners of capital in general (quoted in Simon 1943 at p. 399).

Today the literature distinguishes between three separate 'views' of the property tax, the *traditional view*, the *new view* and the *benefit view* (Zodrow 2001a), although these names have not always been applied to the three schools of argument.

The *traditional view* of property tax incidence, which predominated before 1970, suggests that consumers bear the entire burden of the tax on capital and that landowners bear the entire burden of the tax on land. This view attempts to separate the land component of a property from the capital improvements component. Given the arguments set out in 3.3, and depending on the proportions of pure land to capital improvements, the suggestion is that property tax is borne largely by the occupier of property. In the US, where the tax is assessed on the capital value of a building and is paid by the building owner, this represents a shifting of the tax forwards to occupiers in the form of increased rents. Proponents of this view considered that it may in turn be shifted forwards by occupiers to their customers in the form of increased prices.

Netzer (1966 Chapter III) fully explains the traditional view as it stood before it became the subject of an intense debate at the end of the 1960s. It is now generally accepted that the traditional view was incorrect and Heilbrun (1983) identifies the error of the traditional view as arising from attempts 'to generalise about the effects of the tax from an argument that examined only one jurisdiction at a time'.

The *new view* of property tax incidence reaches a quite different conclusion. According to this view much of the burden of the tax is shifted backwards onto owners of property in the UK (or remains with owners of property in the US). The new view emerged from the seminal work of Mieszkowski (1972), which itself is built on Harberger's model (see 3.4 above). In 1969 Mieszkowski had been one of the first modern commentators to consider the spatial dimension of tax incidence and his views on the incidence were developed further by McLure (1971; 1975) and were subsequently extended by Zodrow and Mieszkowski (1983; 1986). Interestingly, Marshall's early work recognised both the spatial dimension and the impacts that are now accepted under the new view.

The new view of the property tax is now widely accepted (Netzer and Drennan 1997 at p. 103), but it is not without its detractors (see for example Fischel 2001a at p. 170). The main issue with the new view, as expressed by Mieszkowski, is that it is built on a general equilibrium analysis, which must necessarily be undertaken at national level. This fails to take account of the local variations in the tax base and the tax rate, which can vary considerably.

Aaron (1974) christened the Mieszkowski view of property tax incidence the 'new view'. In his partly polemical work, Aaron gives a good review of the differences between the traditional view and the new view, reiterating the chief assertion of the new view, namely that the incidence of the property tax is on property owners. Aaron (1975) also identifies a couple of situations where the traditional view is likely to be correct, such as periods of rent control, when government permits landlords to raise rents in response to a rise in tax.

The *benefit view* integrates local property tax into a Tiebout framework. Charles Teibout (1956) developed the work of Musgrave (1939) and

Samuelson (1954), and applied it to a local framework, demonstrating that the qualities of pure public goods identified by Samuelson need not apply to local expenditures and that, in this context, taxpayers did have choice. Tiebout's framework required a demanding set of assumptions, including perfect mobility between communities and Tiebout used a lump sum tax rather than a property tax to develop his framework.

The path-breaking work of Wallace Oates (1969), whilst primarily empirical, applied Tiebout's hypothesis to the property tax. Oates' work has been influential and many of the studies of capitalisation that followed adopted what has become known as the Tiebout-Oates model (see 4.2.1). Oates predicts that 'for an increase in property taxes, *unaccompanied by an increase in the output of local public services*, the bulk of the rise in taxes will be capitalised in the form of reduced property values'. Where property taxes rise and there is a corresponding increase in public services, Oates implies that the tax will distort user preferences and confirms the Tiebout model of efficiency 'in which rational consumers weigh (to some extent at least) the benefits from local public services against the cost of their tax liability'.

Hamilton (1975) took the Tiebout framework and developed it to show how a system of local taxes on residential property is equivalent to a non-distortionary set of user charges. Fischel (1975) and White (1975) extended this further, applying it to industrial property and showing that tax payments are equivalent to fees for public services. Each of these studies required a Tiebout assumption of high mobility between local jurisdictions but replaced lump sum taxes with the property tax and they introduce an assumption of strict planning controls (zoning ordinances).

Hamilton's arguments and his introduction of zoning into the Tiebout model have been influential and a number of writers have adopted his position, with Fischel in the vanguard of benefit view proponents. He argues (2001b) that the tax is effectively a user charge paid in return for local public services, in which case it is non-distortionary and has no effect on the distribution of income. This is an extreme point of view and it is important to recognise that the benefit view is usually applied to residential property in the US where Fischel links the tax benefits to homeowners' voting preferences.

The benefit view analysis requires strict zoning ordinances and implies a market with a homogenous commodity, which is essentially the housing services approach suggested by Muth (1968 at pp. 285–333). The zoning assumption of the benefit model has been the subject of much debate and the benefit view is not without its critics, who unsurprisingly include Mieszkowski and Zodrow (1989). They stress that the Hamilton version of the benefit view only obtains if the zoning requirements are binding, which is not a realistic assumption. Another criticism comes from Topham (1981), who makes a rare British contribution to the theoretical literature. Topham argues that the benefit view is limited to specific institutional circumstances and that, as a result of the exacting zoning requirements, the benefit view is only applicable in the short run. He concludes that property tax does not reduce to a simple user price.

Zodrow (2001b) provides an up-to-date summary of the benefit view, contrasting it with the new view.

## 3.8 ALTERNATIVE INCIDENCE FRAMEWORKS

Two separate accounting frameworks have been developed by British authors for assessing the impact of local business taxes (Bennett and Krebs 1988; and Tyler et al. 1988). The goal in both cases is the establishment of a framework in which to assess geographical variations in tax rates and in both cases the authors then apply their accounting framework to their own empirical research. Neither can be considered as important contributions to the theory, rather they represent theoretical frameworks, designed for a particular empirical test.

Mair's (1984) extension of Kalecki's insights to property tax incidence represents another isolated example of British development of the theory, this time within a post-Keynesian framework (as explained by Eichner 1979). Post-Keynesian incidence theory is in its infancy, especially for the analysis of the property tax and, apart from its use empirically by Damania (1986b) and Mair (1987), both working in Scotland, it does not gain acceptance in the mainstream literature.

## 3.9 CONCLUSIONS

Several different conclusions can be drawn from this review of the literature, which gives a clear view of the different issues, theories and the alternative possibilities that exist for property tax incidence and capitalisation.

It can be seen that the majority of the theoretical developments in tax incidence assessment have come from the US and there has been little theoretical work carried out in the UK on the incidence of property tax. After Alfred Marshall's early identification of the problem, there is a noticeable absence of British contributions to the theories of tax incidence and tax capitalisation.

Modern neoclassical incidence theory is foremost and other theoretical frameworks do not succeed, at least when judged by the test of the intellectual marketplace.

The most recent literature on the subject identifies two current views (the traditional view having been discredited) and there is a considerable and ongoing debate in the US about which of the competing views of the tax is most appropriate.

Evans (1985), writing from a British viewpoint is equivocal about the validity of Tiebout's hypothesis, on which much of the benefit view literature is based, and which itself is focused on the residential sector. He makes the important observation that what applies in the US does not necessarily apply elsewhere, noting particularly the presence of many more local authorities within one US conurbation and also highlighting possible greater mobility in the US between local jurisdictions.

Undoubtedly some of the US work can be set aside as being contexted too closely within US conditions – what may be correct for residential property in the US is unlikely to apply to business property in the UK.

The Tiebout-inspired benefit view literature is not considered to be highly relevant to this thesis, which takes a fundamentally new view approach to property tax incidence, based on the theoretical background reviewed in

Chapters 2 and 3. From this it follows that the tax is expected to be shifted from the occupier who pays the tax back to the property owner in the form of reduced rent.

The work of Fraser (1985) provides a valid theoretical analysis of tax impacts that is both complete and is applied directly to UK business property. Although it is not placed in the context of the US literature, the view taken by Fraser is essentially the new view of the property tax and Fraser's work is taken as a starting point. Using the model of tax incidence developed in this chapter and applying it in conjunction with the Elementary Rent Model developed in Chapter 2, it is possible to see how, at a theoretical level, the tax impacts can be expected to operate in the UK business property market. In Chapter 6 this will be applied to the research design that is used in the empirical work in this thesis.

Leaving aside for a moment the question of benefits received in return for the tax, it is clear that the most important factor in determining the level of tax shifting will be the interaction of demand and supply in the local property market and it is expected that supply elasticity will dominate.

Benefits received by the taxpayer, or more precisely, differential benefits between taxpayers in different local authority areas will be considered in Chapter 5, which examines the UK Property Tax.

Chapter 4 now reviews the empirical evidence as provided by existing studies in the UK and the US for both business and residential properties.

# CHAPTER 4

# A REVIEW OF THE EXISTING EMPIRICAL STUDIES

## 4.1 INTRODUCTION

This chapter examines the empirical evidence of property tax capitalisation. Just as the theory saw major developments in the late 1960s, there was a corresponding increase in studies attempting to identify the capitalisation and other impacts of property taxes. In 1966 Netzer (1966 at p. 34) noted that 'the empirical evidence on capitalization is most unsatisfactory' but since that time there has been a steady increase in the quantity and quality of research into property tax impacts and, in the United States and Canada, the empirical literature is now well developed, especially for residential property taxes.

In the United Kingdom on the other hand, until recently, there has been little empirical research carried out into the incidence of the UK property tax. In 1975 the Department of Environment considered the evidence (in Layfield 1976 Annex 18) and concluded that 'a difficult research programme needs to be completed before the effective incidence of rates can be established' and, even in 1986, the government stated that 'hard evidence of the effects of rates on business is scarce' (DOE 1986b, para. 2.9). Since then, a number of studies have been made of the UK property tax, with varying degrees of success. The most recent UK research undertaken for the DOE was 'unable to reject the hypothesis that changes in non-domestic rates do not have any impact on commercial property rents in the long run [for properties in the South-East of England]' (Bond et al. 1996a at p. 29).

Residential studies far outnumber the studies of business property and the methodology adopted for residential studies is generally more sophisticated. In this chapter the empirical methodology and the issues surrounding it are examined, following which the empirical evidence for business property is then reviewed. The emphasis is on the UK studies with only a brief examination of the most pertinent US studies. A survey of the most important residential literature is contained in Appendix 4 to this chapter.

## 4.2 DEVELOPMENTS IN EMPIRICAL METHODOLOGIES

In the past 40 years the evidence of tax impacts on property in the US has increased to the extent that the conventional wisdom, as represented by the traditional view of the property tax (see Chapter 3), has changed completely (Ladd 1998 p. 83). Studies on residential property have formed the vast bulk of research in the US.

The earliest empirical study was in 1931 by Jensen in the US and by Hicks and Hicks (1945) in the UK, but the empirical literature did not grow further until the early 1960s with studies by Daicoff (1961) and Woodard and Bradley (1965). These early studies were carried out before the major methodological advances that took place in the late 1960s, when the literature expanded dramatically.

From 1969 onwards there is an important body of research that attempted to test Tiebout's 1956 hypothesis empirically. In the following 15 year period, over 35 studies of tax capitalisation were carried out and this was a period of focus on the mathematical and modelling techniques that are needed to make an analysis.

### 4.2.1 THE TIEBOUT-OATES MODEL

The first and most influential analysis of Tiebout (1956) and tax capitalisation was made by Oates (1969) and has become known as the Tiebout-Oates model (see 3.7). Oates made a cross-sectional study of a sample of residential communities in New Jersey. He reasoned that, if consumers are sensitive both to public service benefits and the property tax costs associated with their homes, these factors should be reflected in house prices. This work is generally interpreted as confirming the Tiebout hypothesis.

Many of the studies of capitalisation that followed have adopted and refined the Tiebout-Oates model, which regresses house prices against public services (i.e. benefits), housing characteristics and tax levels. There have been many studies of residential tax capitalisation (see Appendix 4) and

capitalisation is found by most studies in this group, ranging from 10% (Linneman and Voith 1991) up to full capitalisation (see for example Eisenberg 1996) and in some cases over-capitalisation (Church 1974; Noto 1976).

The majority of the studies carried out, especially in the US, have adopted hedonic valuation techniques and almost without exception have relied on the assumption of highly competitive property markets.

One axiomatic conclusion arrived at by two studies is that estimates of tax capitalisation are sensitive to the specification of the model (see Pollakowski 1973; Reinhard 1981). The inherent difficulties of model specification are considered at length in Yinger et al. (1988), and Eisenberg (1996) makes a detailed and meticulous critique of the methodologies of the major US studies, including the technical specification of the modelling techniques used.

Problems such as the specification of the tax rate variable and simultaneity make the analysis difficult, but the most common problem is the bias that arises through the omission of important explanatory variables. For hedonic techniques, using regression, all major determinants of property value need to be included in the regression equation. The most recent studies go some way to addressing the problems of omitted variable bias experienced with earlier models through the use of more explanatory variables (see for example Eisenberg 1996; Palmon and Smith 1998b; Oktem 2001). Whilst an increased number of explanatory variables does mitigate the problem of omitted variable bias, too many variables may create multicollinearity.

In his 1969 study, Oates adopted a single variable, education expenditure, as the sole public service variable in his model, representing a general proxy for local public services. Following criticism by Pollakowski (1973), Oates added non-school expenditures per capita to the regression equation to address the problem of omitted variable bias (Oates 1973). But finding the right variables to represent the public sector is a common problem in all studies that are based on the Tiebout-Oates model. One of the basic difficulties is how to control for any variations in the level of publicly provided services that must necessarily be considered. Palmon and Smith (1998a)

handle this by their choice of an area in Houston that provides identical public services but which still has varying tax rates. They find that housing market participants rationally discount properties with a higher tax burden, showing full capitalisation.

The Tiebout-Oates model assumes that property prices depend on the capitalised value of expected future property taxes. The choice of discount rate and time horizon is a problem that affects this type of analysis of tax capitalisation. The estimate of tax capitalisation is sensitive to these variables and there is no consensus about what discount rate should be used. Different studies have adopted a variety of discount rates and this is in part the explanation of the differences in rates of capitalisation found. The lack of agreement about discount rate and time horizon leaves a wide dispersion of resulting capitalisation rates.

Only the latest hedonic analyses have begun to take account of underlying property market attributes and the structure of the market. Factors such as the elasticity of supply will influence the likelihood and extent of any tax capitalisation effects but until very recently this has not been taken into account in the hedonic analyses. Cheshire and Sheppard (2002) illustrate this approach within a hedonic framework.

The assumption of perfect competition and market equilibrium underlies the hedonic theory developed by Rosen (1974). This is an assumption of all hedonic analysis but, in practice, the market for composite goods may not be perfectly competitive and this is particularly true for property markets, which are made up of a series of sub-markets (see for example Evans 1995; Dunse et al. 2001). Recent theoretical work by Anderson et al. (2001) has been applied empirically by Oktem (2001) in the only hedonic study of property tax capitalisation under conditions of imperfect competition.

A related problem for hedonic regression studies is the correct identification of the extent of the market, given the presence of sub-markets in the larger property market. All observations that are used to estimate a hedonic price equation must come from within a single market (since the hedonic price schedule represents the locus of equilibrium points within a market). The problems that arise from treating several markets as one are discussed by

Palmquist (2003), but they are often disregarded in the empirical studies of tax capitalisation.

It can be seen that there is a series of complex issues surrounding the specification of the model and the underlying assumptions that are implied by the hedonic technique. A fundamental issue is the availability of sufficient data to enable a hedonic analysis of business rates, which, as will be shown in the following sections, is why so many studies rely on aggregate level data (see 4.5).

In view of the modelling complexity and likely difficulties in obtaining sufficient data, it was decided to develop a simpler model for the purpose of this thesis than is necessarily implied by the hedonic method (see Chapter 6 for a description of the research design adopted).

## 4.3 CLASSIFICATION OF STUDIES

There are several different ways in which the studies considered here can be classified. For each study, the time frame of the research is considered, as well as whether it is inter-jurisdictional, intra-jurisdictional or unrelated to any jurisdiction.

Inter-jurisdictional studies of tax impacts are concerned with the presence of high rate differentials between local authority areas. The possibility of high-tax local authority areas existing side by side with low-tax jurisdictions within a single urban area has long been recognised (Netzer 1966 Chapter V). The significance of this situation is considered in DiPasquale and Wheaton (1996 at pp. 325–331).

Intra-jurisdictional studies, on the other hand, are based on differential rate burdens within the same local authority area. This type of study has the special advantage of not needing to pay any heed to tax benefit offsets because benefits to taxpayers can be considered the same: the level and quality of benefits is constant and the problem of omission or definition of public service variables is avoided (Bloom et al. 1983 at p. 154).

Following Yinger et al. (1988), studies of tax incidence can be broadly classified into three types: studies based on aggregate data, studies based on micro-level data, and micro-level studies based on tax rate changes, into which category this present work would fall.

Aggregate studies are based on national or local statistics, usually collected for some purpose other than the research study. In the UK, these studies tend to be at a national level whilst, in the US literature, the unit of measurement is usually the municipality or local authority area. These studies are necessarily reliant on median values derived from the underlying statistics on which they are based. Such data limitations give rise to difficulties in estimation, but this is still the largest group of tax capitalisation studies.

Most micro-level studies use individual properties as the unit of observation instead of local authorities and municipalities, but one or two studies use micro-data that were not property related. The difficulty with micro-level studies is in the collection of data but these studies have several strengths when compared to those based on aggregate data. These studies can include a large number of explanatory variables, mostly property and neighbourhood attributes. The studies can investigate either inter-jurisdictional tax capitalisation or intra-jurisdictional tax capitalisation, whilst aggregate level studies are either restricted to inter-jurisdictional tax capitalisation or they are non-jurisdictional, not being related to any administrative area.

Studies based on tax rate changes, are described by Yinger et al. (1988 at p. 31) as 'clever attempts to take advantage of unusual market circumstances', which are then utilised to try to isolate the incidence of the tax. The situation that existed in the UK in 1990 is just such a circumstance and it is used as the core basis of the empirical work in this thesis, which uses micro-level data on individual properties to explore the problem of inter-jurisdictional tax impacts.

## 4.4 STUDIES OF BUSINESS PROPERTY IMPACTS

Most of the studies of residential tax capitalisation considered in Appendix 4 have tended to follow a prescriptive format, although there are variations in the approach to data and model specification. These studies have generally been carried out in a Tiebout-Oates framework and have followed the well-established pattern of seeking to test theory through empirical research.

UK studies have taken a more varied approach to the problem, with each study defining its own model without particular reference to other work in the field. Bennett (1988 at p. 159) observed about British studies:

> These studies have taken the pragmatic perspective advocated by Meiskowski (1976), Topham (1983) and Bennett and Krebs (1988), which have suggested that theoretical views on tax incidence have only limited relevance.

It is argued that this pragmatic approach to solving the problem of tax capitalisation has little to recommend it. There is a vast body of literature that can act as a guide in defining and understanding the problem, even if the empirical model eventually selected does not slavishly follow earlier work in every particular.

Studies of business tax capitalisation have taken a varied approach to the problem, with each study being different. This gives a more diverse group of studies for review in the following sections.

Small regard is paid to the tax benefits in UK studies and there is consequently little attention paid to the definition of public service variables that play such a large part in the residential studies. For studies of business property, only one study properly acknowledges the possibility of a benefit offset (Bennett and Krebs 1988). There may genuinely be less variation in benefits to UK taxpayers, given the smaller size of the country and the control imposed by central government, but this does not justify the almost complete disregard of the possibility of benefit offsets in the UK work.

One area of tax incidence that is not considered in this thesis is the tax impacts of the UK Enterprise Zones. Property in these limited special areas was completely exempt from business rates for ten years (initially until 1992) and it received other benefits, including 100% building allowances for corporation tax and income tax purposes and greatly simplified local planning requirements. There is some evidence to suggest that the business rate exemption was quickly capitalised into rents and that 'rising property values in the zones have offset any benefits to firms from the incentives' (Roger Tym & Partners 1984 at p. 79). Overall, it is considered that the package of benefits that are comprised in the Enterprise Zone initiative make a meaningful analysis of the impact of individual components quite difficult.

## 4.5 AGGREGATE LEVEL BUSINESS PROPERTY STUDIES

UK aggregate level studies have tended not only to work at a national level, but also to use national statistics as the basic data source. This differs from the US, where even the aggregate studies are mostly based on local data and there is an absence of national level incidence studies.

At aggregate level, UK researchers draw on a number of data sources including the Census of Production (Mair 1987), the Department of Environment floor-space data, CSO estimates from national and county level GPD components (Bennett and Krebs 1988), Inland Revenue Survey of Personal Incomes and Return of Rates (Blair 1989; Mair 1990a) and a variety of local government financial statistics.

This apparent wealth of alternative data sources illustrates the potential for aggregate level estimation and, when viewed in conjunction with the difficulties of obtaining micro-level property market data, it probably helps to explain why UK research has tended to favour this type of approach. It should be recognised that macro-level analyses suffer from the limitations that arise from the use of national aggregate level statistics. Unfortunately, not all researchers take the same care in validating their data and this also may explain the criticism that macro-level research is often the subject of 'unduly sweeping statements' (Brazer et al. 1974).

### 4.5.1 EVIDENCE OF SHORT-TERM IMPACTS

An important benchmark is Bennett and Krebs' (1988) analysis of the incidence of local taxes on business and their influence on the relative costs of capital in Britain and Germany. This work is the final chapter in a series of studies in the field by the same authors (see for example Bennett 1986; Bennett and Zimmerman 1986; Bennett and Fearnehough 1987). The study uses the local authority as the unit of observation, working at county and metropolitan authority level, with district taxes and expenditures aggregated to county level. Bennett and Krebs do attempt to test and validate the data selected for the study, but they recognise 'the strong constraints on the analysis caused by poor data' (at p. 231).

Results are presented for a period of two fiscal years, 1979–80 and 1981–82, and the analysis is developed from a partial equilibrium analysis right through to a general equilibrium analysis. The latter estimates tax incidence with and without benefit offsets. The study concludes that the short-term impact of business property taxes on prices charged to customers of the taxed entity is low, no more than 18%, and that at a general level the influence of the tax is on corporate profits, estimating that 80–90% of the tax is borne on profits in the short term.

The incidence of business rates on household incomes is considered by Mair (1990a; 1990b) in two studies that examine the impact of UK business rates on family incomes. The first is a study of the position using data for 1979, whilst the second is made following the introduction of Uniform Business Rates in 1990.

Both studies are based on Family Expenditure Survey data and national average rate burdens. Mair works in a post-Keynesian framework (see 3.8) and does not consider the issue of tax incidence: he simply assumes business rates to be a tax on production that is passed on in full to consumers. This use of *a-priori* assumptions that are not supported by the evidence is unacceptable, but having made the assumption, Mair classifies the incidence of business rates by category of expenditure and by household type. He concludes that business rates in 1979 are 'markedly regressive',

but following the 1990 changes and largely, he believes, as a result of higher rates bills for service industries, the regressiveness is modified and they become more progressive. The rationale for this *a-priori* argument is that higher income families spend a greater proportion of their income on services. These two studies by Mair are not considered to be a worthwhile contribution to the literature and they are also subject to the key criticism levelled at much of the work that seeks to aggregate local phenomena to a national level, in this case through the use of national average rate burdens.

Earlier work by Damania (1986b) used a general equilibrium framework and 'endeavours to infer' the effective incidence of business rates in the UK. Damania develops a model of wage expectations in a single sector, again using a post-Keynesian theory that is based on the mark-up approach. The analysis is based on the methodological approach pioneered by Musgrave and Kryzyaniak (1963). Confirming the Bennett and Krebs results of limited price effects (forward shifting), Damania concludes that 'less than 14% of the property tax is shifted forward into prices' (at p. 309) and, to this extent, he considers that the property tax is 'like an excise tax'. The incidence of the remaining 86% is not identified in the results obtained by Damania, but he suggests that it will be borne on profits, at least in the short term.

The studies reviewed above illustrate the short-term impact of the UK property tax. Whilst the work of Mair can be discounted because of his questionable use of a-priori assumptions, the evidence from the other studies is that, in the short term, the tax is borne on profits, and in limited circumstances it is shifted forward to consumers in the form of increased prices. Whilst the aggregate level studies can be criticised from a data perspective, this finding is exactly what would be expected in the short run from the theoretical analysis made in Chapters 3 and 4. The unanswered question is whether the impact of the tax bears on property values in the medium to long term.

### 4.5.2 EVIDENCE OF IMPACTS ON EMPLOYMENT

A different strand of the literature looks more closely at the impact of rates on employment at a regional level. Cuthbertson et al. (1979) and Gripaios and Brooks (1982) studied the effect of local authority fiscal policy on regional employment, including both tax impacts and the overall budgetary consequences of local policies. These related studies identified some important adverse effects from local taxation; the second work is a development of the first and uses data at 1974. Again the authors comment on the inadequacies of the available data. The findings, at county level, distinguish between expenditure financed by taxation and other local authority expenditures. In the long run, a £1 million increase in local authority expenditure, if financed by taxation, is predicted to result in a loss of 1,288 manufacturing and 818 service jobs. The same increase in expenditure, if financed other than by taxation, (the authors do not explain how) is expected to have a positive effect on total employment. On the face of it, these results do not seem very likely. The actual job loss figures suggest a precision that cannot easily be justified by the data and the magnitude of changes predicted seems improbable (even at 1974 values). The authors assume an 'average' county and the model used does not measure the regional or other policies of central government, the stated assumption being that the impact of these policies will be equally spread across the country, both of which assumptions are considered incorrect.

Crawford et al. (1985) investigated the effects of business rates on the location of employment. The main conclusion of this study was that there is little influence of business rates on jobs. The only sector where there was evidence of a link was commercial offices and, when central London was analysed separately, the evidence produced no statistically significant results. There was no evidence of a link in the manufacturing, retailing and warehousing sector. This report has been subject to a great deal of criticism and is now considered to be 'thoroughly discredited' (Mair 1990b).

Mair (1987) again uses a post-Keynesian approach to tax incidence. Taking manufacturing data from the Census of Production between 1973 and 1982, this study makes a partial equilibrium analysis. Mair finds that business rates

are not 'met through wages share of net output' and the results suggest that only a small share of any increases in business rates paid by manufacturers will be recovered by higher mark-up prices. This suggests that the burden of the tax is borne on capital, either in the form of lower profits, or in the form of lower factor payments, in this case rents. Similar results were also found in the earlier work by Trussler in 1982 (quoted in Mair 1991).

Crawford et al. and the Cuthbertson/Gripaios studies are strongly criticised by Damania (1986a), who finds the Gripaios model weak and the model used by Crawford et al. to be statistically flawed (Damania 1986b).

The results of these studies are inconclusive and contradictory, and they provide little satisfactory evidence that the property tax has a marked impact on employment or wage levels. Doubts about the methodologies employed make it difficult to be confident about the results presented. Other studies of the impact of rates on jobs by Hughes (1981) and Othick (1983) are found to be crude (Bennett 1988) and this area of the literature is not reviewed further here.

### 4.5.3 EVIDENCE FROM OTHER AGGREGATE STUDIES

Another aggregate study in the UK by Blair (1989) failed to reach any conclusive results on the tax impacts. Taking an aggregate level approach using national statistics, Blair complements his results with micro-level data generated from a questionnaire survey.

Tyler et al. (1988) use aggregate data from the Census of Production to validate their accounting framework for assessing the effect of local taxes on business. They then use the results to assess the impact of a location change on the rate bill of a firm. Using the case of the telecommunications equipment industry in 1982, the authors demonstrate the presence of a rate gradient with decreased tax costs as distance from central London increases.

A closely related theme is to look at the impact of tax differentials on business location decisions and economic activity. This ties the study of tax incidence more closely to the theoretical work of Muth (1969) and Mills

(1972), which was considered at 2.5. Several US studies carried out in the early 1980s concluded that differing levels of local taxes, which include the property tax, have a statistically significant effect on the location of business activity across local authority areas within the same urban centre (Wasylenco 1980; Fox 1981; Charney 1983; McGuire 1985). Each of these studies relies on cross-sectional data to estimate the relationship between business activity and the tax and, although the robustness of the conclusions varies from study to study, all confirm the importance of differential tax rates on business location decisions and thus on property values.

A line of related work, also in the US, has sought to show the impact of the tax on property value growth rates (McDonald 1993b; Dye et al. 2001). This is important because tax capitalisation is likely to manifest itself through differing rates of value growth, and this is a prime aspect of the empirical study that is carried out for this thesis.

The aggregate level studies above go some way to answering the question of how the short-term tax impacts are borne, albeit within the limitations of the varying methodologies adopted. Little consideration was given in the studies reviewed to long-term tax impacts and no attempts have been made to identify whether this impact remains with the firm or is shifted backward to property. The UK micro-level studies reviewed below, with one exception (Bennett and Fearnehough 1987), use data for individual property and have this issue as the chief focus.

## 4.6 MICRO-LEVEL BUSINESS PROPERTY STUDIES

This thesis makes an inter-jurisdictional micro-level study of business tax impacts, using individual properties as the unit of observation and it falls into the category of a tax change study (see 4.3). It follows that the micro-level studies of business tax impacts reviewed here are more central to the theme of this thesis than the aggregate level work.

This part of the review will assist both in terms of the evidence of capitalisation presented as well as the development of the most appropriate

methodology. The work is presented in chronological order of the literature development, with US studies first.

### 4.6.1 US EVIDENCE

The earliest US study of business tax impacts by Clapp (1980) suffers fatally from the use of a property tax observation that is based on the tax bill for the whole building, which Clapp does not break down into a per square foot (in the US) basis to reflect the size of the building. However, there are two US micro-level studies that do need to be reviewed here, both of which use hedonic pricing functions in their model.

The work of William Wheaton (1984) in the US is thematically congruent with this thesis. Even in the US, Wheaton identifies the same lack of empirical evidence for property tax incidence on business property, stating that 'the prevailing view ... is largely the result of some educated conjecture and a few scattered pieces of research'. Wheaton studies commercial property in the Boston Standard Metropolitan Statistical Area, and the focus is on rented property, following the analytical tradition of Musgrave and Kryzyaniak (1963). The results of Wheaton's research suggest that the burden of inter-jurisdictional tax differences is not passed forward to tenants, but remains on capital. This is an important result, according precisely with the hypothesis of this thesis. In common with many US commentators, Wheaton also explains that part of the burden may be shifted backward to land although, in this work, urban property is defined to include land and buildings (capital).

Wheaton is careful to point out that the results refer only to a proportion of the capital market (commercial buildings) and only to one metropolitan area, making it clear that different results may be obtained for other asset types or other areas. This is a recurring theme in the empirical studies reviewed in this chapter.

Ten years later in Chicago, McDonald (1993a) studied office rents in 1991 in a study of intra-jurisdictional differences in property tax rates. This is a partial equilibrium analysis, based on cross-sectional data, seeking to show initial shifting effects. The findings show that 45% of property tax differences

across buildings was shifted forward to tenants, implying that 55% of the differential falls on capital and is absorbed by the building owner. McDonald is very confident about the quality of his data, but he concludes 'further cross-sectional and time-series studies of other commercial real estate markets are needed to determine the generality of the results presented here'.

### 4.6.2 UK EVIDENCE

Four UK studies are reviewed in this group of micro-level studies, which are listed in Table 4.1 below. The findings of a 1993 study on behalf of the Department of Environment (Gerald Eve and City University 1993) were not published and are not reviewed here. This study was cited in Bond et al. (1996a at p. 23) where it was stated that the 'empirical evidence was somewhat mixed and their results failed conventional statistical tests'.

**Table 4.1: Micro-Level UK Studies of Tax Incidence**

| Name | Date | Context | Data Type |
|---|---|---|---|
| Bennett and Fearnehough | 1987 | Inter-Jurisdictional | Questionnaire Survey |
| Sibley | 1989 | Inter-Jurisdictional | Individual Property |
| Crosby and Keogh | 1990 | Intra-Jurisdictional | Individual Property |
| Bond et al./DOE | 1995 | Non-Jurisdictional | Individual Property |

The three studies that are based on individual property observations stand out for special attention because the researchers have adopted techniques that are close either to the methodology or to the theme of this thesis.

The two inter-jurisdictional studies are concerned with the presence of high rate differentials between local authority areas.

Crosby and Keogh (1990) undertake an intra-jurisdictional study, based on rate burdens within the same local authority area.

The work of Bond et al. is not based on any local authority administrative areas and has been classified as non-jurisdictional. Despite being based on

individual property data, this work attempts a regional level of analysis and for this reason it is more like an aggregate study than a micro-level work.

### 4.6.3 BENNETT AND FEARNEHOUGH

This is the only micro-level study that is not closely focused on identifying the extent of property tax capitalisation and which does not use property data. Bennett and Fearnehough (1987) adopt a survey methodology to examine the impact of differing rate burdens on a single industry. The hand tools industry is geographically concentrated in Sheffield, where one third of the firms are located, with the remainder being spread evenly across the country. Sheffield was at the time of the study a high rate area, which could be compared to a wide range of lower rated areas. The survey methodology is supplemented by econometric checks for validity and the results show few firms believing that business rates are in any way a benefit tax. Firms in the high rated area suffer from increased rate burdens, but in a competitive industry have few opportunities to pass increased costs on to customers. The conclusions are that the rate burden is borne on capital in the form of reduced profits, in some cases of up to 100% and, where these differences are prolonged, the impact on capital formation is high, with possible consequences for relocation and fiscal migration.

The authors give no consideration to the possibility of the tax burden being shifted backwards in the form of reduced rents, but the reason for this omission is not clear.

This micro-level study tends to confirm the findings of the aggregate work reviewed at 4.5, that, in the short run, in a competitive market, the impact of the tax is on the profits of the business. In other words, it cannot be shifted in the short run and remains with the bearer of the legal incidence.

### 4.6.4 SIBLEY

In 1989, Sibley published research on the effects of business rates on the office property market around the Camden/Westminster boundary. This was a micro-study taking market data collected from property agents for the

years 1983, 1984 and 1985 and it is especially interesting because it deals with the same two boroughs selected for office property for the empirical work in this thesis.

This is an inter-jurisdictional study of tax incidence, but no recognition is given to the possibility of there being any differential tax benefit to occupiers between local authority areas.

Sibley suggests that the rate differentials that emerged between 1979 and 1982 are the starting point for the emergence of tax impacts, which makes this a short- to medium-term study with a time frame of between two and six years.

Sibley's data collection is careful and his data categorisation takes account of both building quality, tenant quality and other occupation costs.

The main problem with this work is that the analysis is basic and contains no tests for statistical significance or even measures of distribution. This seriously undermines the quality of his research and the importance of the results.

The results presented by Sibley do indicate a difference in rental values between borough boundaries, represented by a difference of £0.90 per square foot, yet the average difference in rates would imply a difference of £2.14 if the tax is fully capitalised into rents. Sibley concludes that 'although the market has adjusted rents to reflect the rates disparity between boroughs ... the market has not fully adjusted for rate differences' (at p. 339). He goes on to detail a series of reasons why this may be so, including the impact of the institutional lease and the impact of rate capping, which he posits may have reduced the risk of rates rising uncontrollably, thereby changing tenants' expectations and rental bids.

Ian Sibley kindly agreed to permit his data to be used in the pilot study that was undertaken in this thesis (see 8.3).

### 4.6.5 CROSBY AND KEOGH

A meticulous study of shops in central Nottingham was made by Crosby and Keogh (1990). This study incorporates both a micro-level analysis and an analysis in the tax change category.

This micro-level analysis of tax impacts is unique amongst British empirical work, being the only study to adopt the long-term time frame that theory indicates is appropriate. The micro-level study covers a period of up to 16 years between 1973 and 1989.

In 1986–7 a local revaluation of the tax base took place for retail property in central Nottingham, referred to by the authors as a 'mini-revaluation'. This circumstance is used as an opportunity to study the effects of changes in rate burden on shop rents in the locality.

Market data were collected from the records of local property agents, supported by a postal survey of retailers in Nottingham to collect additional data and to explore occupiers' attitudes to rates.

Unlike other UK studies of tax impacts, this is an intra-jurisdictional study of tax shifting, with all properties in a single local authority area, so the problem of differential benefits does not arise. The survey questionnaire did include a question about the 'extent to which local services represent value for money' but no consideration is given in the data analysis to this issue, nor is it necessary.

The data analysis took a two-pronged approach to try to identify the impact of the tax on retail property rents. First, rents between 1973 and 1989 were analysed using pooled cross-sectional and time series property transaction data (the micro-level analysis). A second analysis was made using a subset of the transaction data where there were transactions both before and after the mini-revaluation in 1986–7 (the tax change analysis).

Surprisingly, the study found little evidence of a relationship between rate bills and property rents, stating (at p.18) 'in no case was it possible to identify a significant negative relationship between real rents and real rate

poundages' and the data 'do not support the hypothesis that rents offset rates to keep occupation costs constant'.

Several possible explanations are evaluated by the authors, including the possibility 'that rising rate poundages in the mid to late 1980s were swamped by the exceptional growth of retail profits and rents in that period'. This conclusion seems to be well founded: the 1973–1989 analysis examined serial tax rate differentials (changing rate burdens over time). This makes it harder to isolate the tax impacts when compared to an analysis of spatial tax rate differentials (differences between properties at one point in time).

The data used are transaction data, and whilst these are *prima facie* the best data to use, it means that measurements cover differing periods, starting in 1973 but in some cases later. Crosby and Keogh point out that the data may be 'less complete in respect of earlier transactions' (at p. 12) and this will reduce the effective time frame for the analysis. They also recognise (at p. 13) that there are particular problems associated with the analysis of market evidence, and this could influence the results, especially in the context of retail property (see Appendix 2).

The authors experienced a severe problem of controlling for all the variables affecting the rents in order to isolate the specific effect of the property tax. The model employed by Crosby and Keogh did identify 'a number of statistically significant retail zones' (p. 24) within the centre of Nottingham and a key finding of the research was that retail property values are extremely sensitive to location. Location is confirmed as a key determinant of retail property value and many of the problems of data analysis can be put down to the difficulty of handling the micro-location of property in the analysis. Micro-location was identified as a critical factor in determining retail rents in a prime city centre shopping district.

In relation to the analysis across the mini-revaluation, it is possible that the time frame was, in this case, too short, such that the rents did not have sufficient time to adjust to reflect the changed rate burden following the revaluation and this problem would be exacerbated by the rigidities of the institutional lease.

The postal survey of retailers asked questions about the mini-revaluation (pp. 20–23), which 'revealed a poor understanding of what had happened ...' and questions about the forthcoming 1990 changes 'suggested that little advance planning was taking place'. Respondents were asked to consider their strategy for dealing with a hypothetical increase in rates payable of 15–20% per year over the next five years. This is a more interesting question from the perspective of the current work and the 'most likely' response given was that occupiers would expect to negotiate a reduction in rent at the next rent review. Having said that, the occupiers did not expect to be able to offset the full cost of the rate rise against rent. Fewer than a quarter of respondents expected to be able to offset 50% or more of the increased rates in this way.

### 4.6.6 BOND, DENNY, HALL AND MCCLUSKEY

Bond et al. (1996a; 1996b) made a study of tax effects on business property rents, following the introduction of the new rating system. This is a national study of serial tax rate differentials rather than a study of geographic tax rate differentials. The use of micro-level property data puts it into this category of analysis (following Yinger et al. 1988) but the methodology employed makes it analogous to an aggregate work.

This study was undertaken on behalf of the Department of the Environment by the Institute of Fiscal Studies. The results were published in several places and the findings are not clearly presented in the published work (DOE 1995b; Bond et al. 1996a; Bond et al. 1996b; McCluskey 1999a [one paper out of 35 submitted for a DPhil by publication]).

This is a short- to medium-term study that uses circumstances of tax change to try to elicit evidence of the tax effects on rental values, in this case the new rating system that was introduced in 1990. This is exactly the same circumstance that is adopted in the empirical work in this thesis, although there are some crucial differences between the work of Bond et al. and the present work.

Bond et al. worked with time series data on individual properties from the Investment Property Databank (IPD) between 1987 and 1992. This data source has the benefit of containing a large number of properties but the authors recognise the data used to be panel data, explaining that 'unfortunately we have very little information on the attributes of the properties within the sample'. The data used for this study are based on property level data rather than unit or tenant level data. The latter are necessary if the correct rateable unit is to be identified in the analysis (see A2.4 for a discussion of rateable hereditaments).

Property information in the IPD is representative of prime investment quality property, which is not representative of typical business properties in England and Wales. The IPD has a disproportionate number of high value lots and is concentrated in London and the South-East and 'has very few small properties of any type' (DOE 1995b at p. 62). The study utilises the IPD property sector definitions of Retail, Industrial and Office, but only limited regard is paid to the government regions that are used extensively in the IPD data. The only regional results that are reported are for retail property and then only between London, the South-East and Elsewhere.

Notwithstanding the short time period covered by the data, the authors develop a predictive econometric model and, in their national analysis across property types, they predict a long-run decline in rental values of £4.92 for each £1 increase in rate burden. Based on the theory reviewed in Chapters 2 and 3, this is a highly improbable prediction and the authors recognise that it 'seems too large to be plausible' (Bond et al. 1996a at p. 27).

To 'allow for some degree of heterogeneity' between property types, the authors go on to make the analysis separately for retail, industrial and office properties, but only the results for retail property appear in the published work. The model for retail properties continues to predict over-capitalisation in the long run, suggesting a £1.79 decrease in rents for every £1 increase in rate burden, which again seems to be improbable.

For industrial property, the 'results were imprecise' whilst, for office property, the results 'were the least satisfactory' and 'there is clear evidence that the

specification is invalid' (DOE 1995b at p. 41). No results were presented for industrial or office property.

In spite of a pronouncement that 'property market responses were found to operate with considerable delay' (Bond et al. 1996a at p. 29), the model is also applied in a short-run analysis and the authors believe that 'estimates of the impacts ... after one or two years are likely to be more reliable' (Bond et al. 1996b at p. 32).

The short-run findings for retail properties show that above average increases in business rates were associated with below average increases in commercial property rents, suggesting that at least part of the rate burden is capitalised. For retail properties, 'one can reject the hypothesis that there is no effect on rent but not the hypothesis that the entire burden is passed on to the landlord'. The short-run results are ambiguously presented and continue to infer long-run impacts, stating for example, that 'eventually, the impact of a £1 increase in non-domestic rate bills has roughly twice as large an impact in London and the south-east of England as elsewhere' (Bond et al. 1996a at p. 29). They then go on to explain that 'these estimates are particularly imprecise in the South-East where we were also unable to reject the hypothesis that changes in non-domestic rates do not have any impact on commercial property in the long run'. Elsewhere it is stated that 'rent levels appear to adjust slowly to changes in tax bills, particularly outside the South-East' (Bond et al. 1996a at p. 18).

The final conclusions (Bond et al. 1996b at pp. 31–32) are that:

> Whilst we cannot reject the hypothesis that rents fall pound for pound with rates in the long run, leaving total occupancy costs constant and shifting all the burden of rates onto landlords, nor can we reject the hypothesis that that rents fall by only 80p; and indeed ... we cannot reject the hypothesis that the long-run fall in rents is only 50p.

This is an inconclusive summary and the authors go on to comment that 'uncertainty about the long-run effects of rates increases is not surprising given that we have only six years of data in total, and only two years and

eight months of data after reform of non-domestic rates in 1990'. The DOE report observes that 'one limitation that could be resolved in future work is the short time period covered by this data-set' (1995b at p. 2).

There could be a number of different explanations for the results found in this study, but the time frame of the study, poor model specification and issues with the underlying data are likely to be the chief explanation of the unconvincing results.

The data in the IPD are based on both open market lettings and estimated rental values (see 2.6.5 and Appendix 2). Crosby and Murdoch (2001) draw some important conclusions about the valuation inputs that underlie the IPD data-set and make suggestions for 'eliminating inconsistencies in the data provided' but problems arising from the underlying nature of the IPD data were not recognised by the authors.

The possibility of benefit offsets and variations in the scope and quality of local public services is mentioned by the authors but dismissed (in Bond et al. 1996b at p. 24) and no consideration at all is given to the benefit effects in the other published work. No attempt is made to take account of tax benefits in the analysis.

Perhaps the most important shortcoming of the study is that it does not pay any real regard to local differences in the property markets. To reflect differences in property market conditions, the authors use a proxy based on labour market conditions, recorded at county and regional level, with no attempt to justify or explain the choice. Property markets do not operate at county level, still less at regional level and it is thought unlikely that labour markets could be relied upon as an accurate indicator of property market conditions.

Two additional difficulties arise from the choice of a time frame that brings its own set of analytical problems. First is the tax base revaluation that came into effect in 1990. The change in the tax base introduced a new set of inter-regional adjustments and distortions, which are neither recognised nor addressed in this work. The second problem comes from the 1989–1993 recession in the UK, which itself could explain the downward changes in

property values during the period and this is not handled in the analysis in any meaningful way.

A number of minor issues arise from the use of time series data. One example relates to the fact that 20% of the properties in the sample had changes in floor-space during the period of the study (DOE 1995b at p. 50), but the rateable value in each year is not available. This means that physical changes to the property cannot be reflected in the rate burden, but they are reflected in the rent.

Despite the use of individual property data, this study can be regarded as an aggregate level work. This was recognised by McCluskey (1999a) who observes that 'the research was able to draw important conclusions as to the regional effect of rates on open market rents' (at p. 67) although in reality the analysis was not made at the level of the standard UK economic regions. As an aggregate study it is subject to the same concerns and criticisms of aggregate level research that were considered at 4.5 and the conclusions must be treated with caution. The authors themselves counsel (Bond et al. 1996a at p. 24) that 'one should be extremely cautious about extrapolating the results to the property market as a whole'. This would seem to be sound advice, given the lack of attention to heterogeneous property characteristics, the absence of unit level data, the failure to take account of regional or local market factors and the gross overestimate of capitalisation predicated by their model.

## 4.7 CONCLUSIONS

There are a number of different approaches to the problem of tax capitalisation: in the US the inclination is to let the theory guide the model specification. British studies have not seen the need to define themselves in the precise terms of the theoretical literature and part of the explanation for this could be that the theory is very much a product of the US context and thus is less applicable in the UK.

It is a familiar theme in the empirical literature that data are difficult to obtain and to analyse and this problem seems worse in the UK than in the US. The

difficulties of getting adequate data are compounded by the inherent methodological difficulty of estimating tax capitalisation.

The various empirical studies reviewed here have strengths and weaknesses: aggregate level studies may provide general insights, but are often unable to answer the incidence question; many of the other studies were poorly executed, or utilised a flawed model or were hampered by data constraints.

Differences in results between studies will inevitably reflect the experimental methodology and are in part explained by the different time horizons adopted. One of the most important conclusions to be drawn from the literature is that a long-term time scale is needed for the analysis of tax impacts on property values. It is also concluded that the analysis should be at a local level using individual property data. Most studies adopt a short time horizon, which is unlikely to give the capitalisation effect time to manifest itself fully: only one UK study adopts an appropriately long-term time scale. These conclusions, which follow from the examination of theory made in Chapters 3 and 4, will be applied in the following chapters when designing the empirical study.

For business property many aggregate studies find evidence of tax capitalisation, but the multiplicity of alternative approaches adopted in the British studies makes it difficult to draw conclusions. Bennett (1988) observes that 'a major problem with all of these [UK] studies is that they are aggregate generalisations'. It might also be added that many of these studies also lack proper theoretical foundations.

The aggregate level work reviewed here suggests that only limited forward shifting of the tax takes place and that backward shifting to wages is even less in evidence. This body of work makes it clear that the major impact of business rates is borne on capital. In the short term, this must mean reduced profits, but the analysis does not go on to consider whether this burden remains with the firm in the medium to long term or is shifted back to other factors, specifically property.

Turning to the micro-level studies that considered property tax impacts, it was a common theme amongst the UK studies that the results, where they were obtained at all, were not as strong as expected.

The findings of this review suggest that the analysis must be at local level and be property unit specific if the results are to be meaningful. Only the studies by Sibley, and Crosby and Keogh fall into this category but neither managed to obtain significant results. Sibley's absence of statistical analysis makes his results of questionable value; while for Crosby and Keogh it is likely that the complex influence of retail location frustrated their attempts to identify the tax impacts. It is also probable that too short a time period elapsed following the mini-valuation in 1986–7 for results from this part of their study to become manifest.

The work of Bond et al. did find statistically significant results for tax impacts on retail property in the short term. The analysis is carried out at a highly aggregated regional level with only three regions for the whole of England and Wales and this study is in many ways akin to the 'aggregate generalisations' referred to above. The authors ask much from their data and the overall conclusions are unconvincing: the findings of their study should be viewed with caution.

The identification of tax impacts on business property has eluded previous researchers; there are no published results for industrial property, no statistically significant results for offices and the results for retail property (Bond et al.) are of questionable value. The identification of such results is the subject of the empirical work set out in the following chapters.

Chapter 5 now looks at the background to the UK business rate system and considers the six London local authorities that are the subject of this thesis.

# CHAPTER 5

# BUSINESS RATES: THE UK PROPERTY TAX

## 5.1 INTRODUCTION

This chapter reviews local government finance in the UK with the emphasis on business rates. Appendix 1 sets out the legal framework for the operation of business rates. A review of the organisation of local government is given, followed by consideration of the circumstances and arguments that led to the major reforms of 1990.

The political background to the tax is then examined, with the emphasis on the state of affairs that led to the emergence of marked tax rate differentials. This wide ranging discussion is based around the work of Bennett and Krebs (1988).

A short consideration of the six London boroughs used for the empirical research concludes the chapter, including a look at the tax rates that applied in these boroughs at the time of the main study.

Rates are unusual amongst taxes because the amount of revenue to be raised is decided in advance and this total liability is then levied on the taxpayers according to the values of their properties (see A1.3.2). The precise yield from other forms of taxation is not known in advance and, in the past, with less sophisticated economic forecasting, this element of certainty in the property tax was a central feature, especially when the expenditure levels were set locally. Today, the level of the business rates is set by central government, so the ability of local authorities to make their own budget is curtailed. Nevertheless, it is still possible for local government to set its own level of Council Tax charges on residential property.

Business or General Rates have not been the only rates charged in England and Wales. There have been other rates, such as the Water Rate and Land Drainage Rates. These two levies differ from the rates tax in that they more closely follow the benefit principle of taxation, while, in a loose way, the General Rate follows the ability to pay principle (see 3.3.5).

The only rates with which this thesis is concerned are business rates, which is the UK property tax that is levied on business occupiers.

## 5.2 LOCAL GOVERNMENT ORGANISATION

### 5.2.1 A HISTORY OF REORGANISATION

Local authorities are statutory bodies created by Act of Parliament. In 1960 there were over 1,600 local authorities in England. The reorganisation of local government in the UK between 1965 and 1974 reduced the number of local authorities by two thirds to about 450 (OECD 1997a), and a further review was completed between 1995 and 1998, with the creation of 46 new unitary authorities.

In London the main reorganisation of local authorities was carried out between 1963 and 1965 under the provisions of the Local Government Act 1963, which adopted many of the recommendations of the Herbert Report (1960). Under the reforms covered by the Act, the number of councils in London was reduced from 96 to 33 (including the City of London) and the process involved an extensive merging of the existing local authorities' boundaries to create larger organisational units. Policy makers envisaged that the larger administrative units would improve the efficiency and coordination of services in London (Byrne 2000).

The Greater London Council (GLC) was created at that time to provide a new regional tier of local government for London. It replaced the smaller London County Council. Figure 5.1 shows a map of the Greater London area and the 33 borough boundaries. The GLC was abolished by the Local Government Act 1985 to be replaced by an unelected London Regional Authority, which was in turn replaced by the elected Greater London Authority in July 2000.

Today, local government in Britain is structured in two contrasting ways. In Scotland, Wales and some parts of England there are single-tier authorities responsible for all local authority functions. The 33 London boroughs are single-tier authorities with responsibility for all functions except a few that are

Figure 5.1

# MAP OF LONDON BOROUGHS

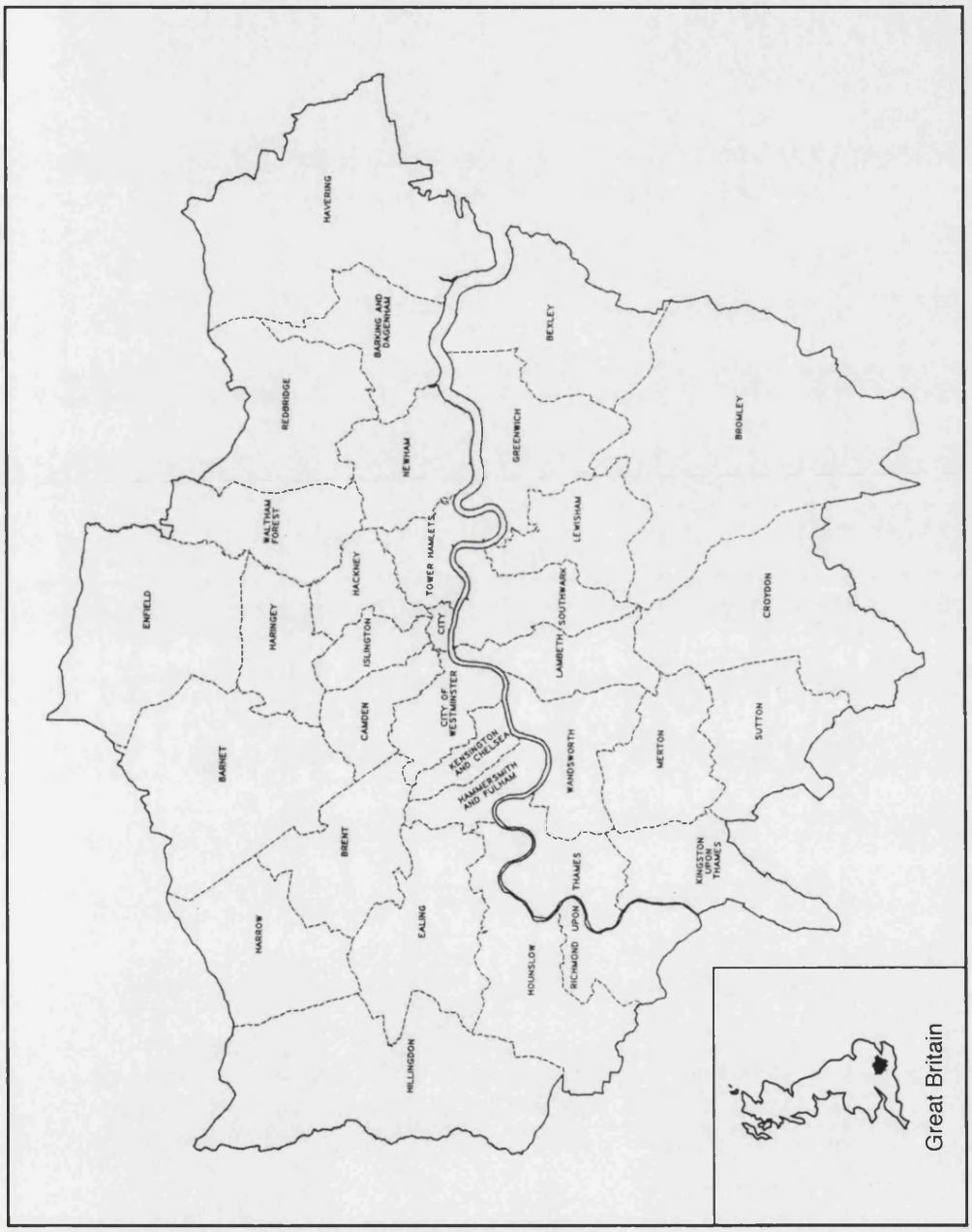



**Figure 5.1: Map of London Boroughs**

coordinated on a London-wide basis. In this thesis, the City of London will be included in the group of 33 London boroughs, although strictly speaking it is a separate Corporation.

The remainder of England had a two-tier system with responsibility divided between district and county council.

### 5.2.2 REVENUE AND SOURCES OF FINANCE

Local authorities raise their income in a number of different ways. Figure 5.2 shows the sources of local government revenue. Figure 5.2a shows the breakdown for 1989–90 and Figure 5.2b for 1999–2000.

In 1999–2000 business rates accounted for about 17.5% of revenues and council tax a further 14.5%. Central government grants at around 52% form the major source of local government revenue, with the remaining amounts being made up of fees and charges, interest and reserves.

Until 1990, local authorities were responsible for setting their own rate of business property tax but today the level of business rates is set centrally by national government. The locally collected tax is paid to a central pool from which it is redistributed to local authorities on a simple per capita basis, creating what is 'effectively a hypothecated national tax' (Ridge and Smith 1991 at p. 27). Local government still sets its own level of Council Tax on residential property, which leaves some budget setting discretion with the local authority.

Single-tier authorities are responsible for all local government functions within their jurisdiction and this includes collecting the rates and, before 1990, it included setting or *levying* the rates. In two-tier jurisdictions this responsibility fell on the district council. The local authorities that were responsible for levying and collecting the local tax were known as rating authorities. Those authorities that were not empowered to levy a rate could still impose a 'precept' on the rating authority and the rating authority must take this into account when levying its rate. The most obvious example of a

## SOURCES OF LOCAL GOVERNMENT REVENUE

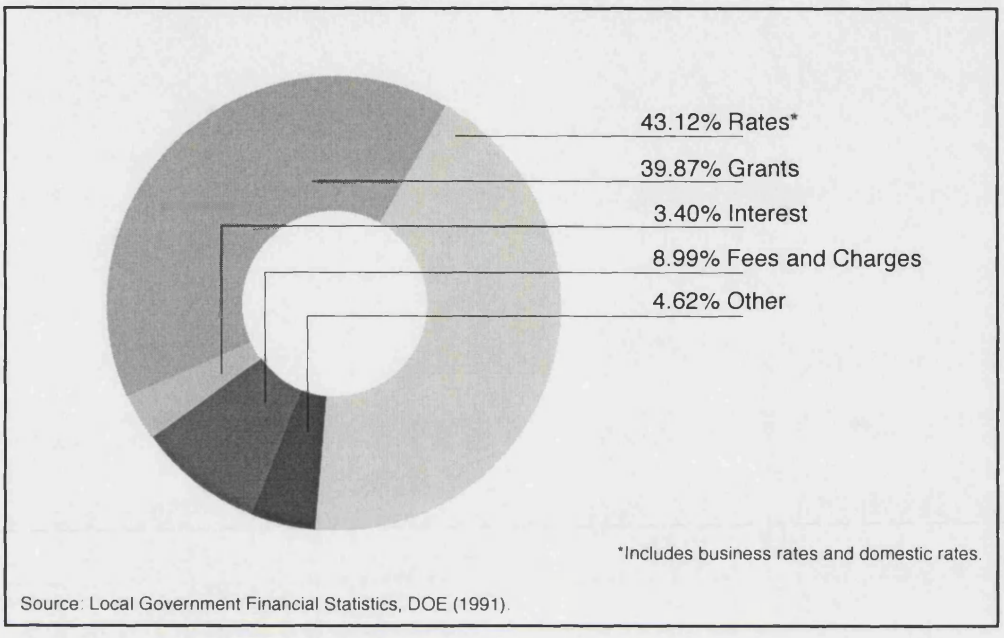



**Figure 5.2a: Revenue Sources 1989–90**

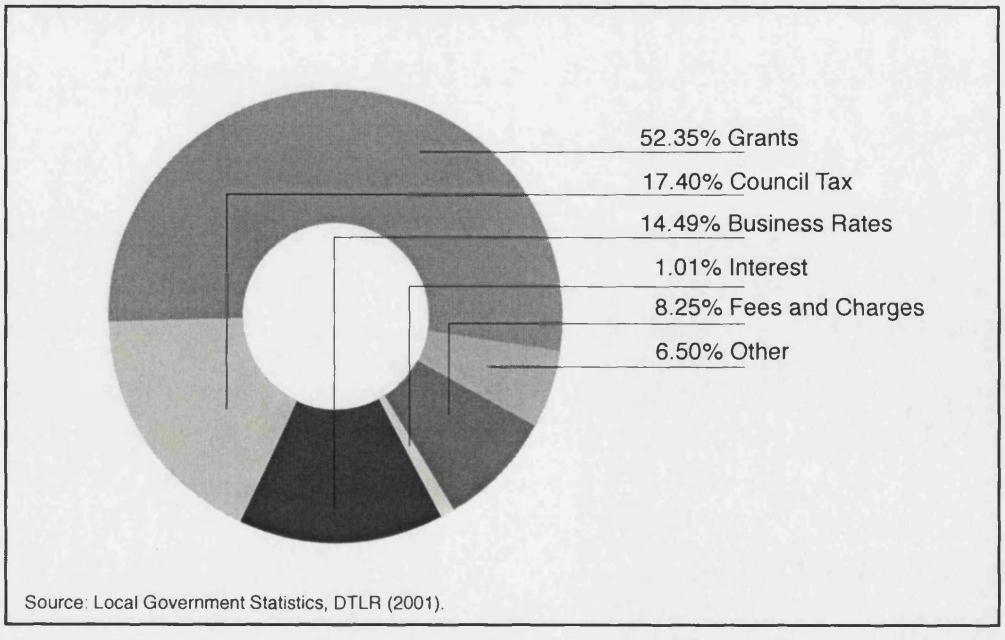



**Figure 5.2b: Revenue Sources 1999–2000**

precepting authority is the county council in any area with a two-tier administration and, in this case, the precept is known as the county precept (see A1.3.4). Since 1990 the local authority that collects business rates on behalf of central government has been known as a billing authority.

Recent proposals suggest a move away from central control of the business rates to a system that would allow some local setting of the tax rate. A full discussion of these options can be found in Denny et al. (1995) or Denny and Ridge (1992). The most recent developments in central government policy are for Business Improvements Districts (BID) which are to be financed in whole or in part by a BID levy imposed on business ratepayers in the district (DETR 2000b; Local Government Bill 2002/03, Part 4). These proposals are not considered in this thesis.

## 5.3 BACKGROUND TO THE 1990 CHANGES

Prior to 1990, revaluations of the tax base did not take place regularly in England and Wales. A new valuation list was supposed to be prepared every five years, but the previous list was introduced in 1973. Appendix 1 sets out the purpose and background to the process of revaluation. A great deal of concern was expressed about the inequities that would arise following the 1990 Revaluation (see for example Cunnane and Walker 1989; Goodchild 1989). This was not a new problem: after the criticisms that followed the rating revaluation of 1973, the Government appointed a Committee of Enquiry into Local Government Finance under Sir Frank Layfield (1976). The revaluation of 1963 had been met with a similar response in the form of the Report of the Committee of Inquiry into the Impact of Rates on Households (Allen Committee 1965).

Each revaluation resulted in a redistribution of rate burdens and increased popular dissatisfaction with the rating system, especially as it still applied to domestic property at that time. No other major tax is paid directly by individuals and the high visibility of the tax increased its unpopularity.

The main weakness of rates, in fact, was the lack of buoyancy, namely the inability of the rates to finance expanding local authority expenditures. Layfield identified this problem as 'fiscal imbalance', the problem that local authorities' responsibility for expenditure was more extensive than their capacity to raise revenue. As early as 1901, The Royal Commission on Local Taxation (Balfour 1901) advocated a system of central government grants to redress the imbalance and, by 1975, a large proportion of local government spending was financed by central government grants.

When the Layfield Committee reported in 1976, the UK rating system applied equally to residential and business property. In Layfield's view, if local autonomy was to be pursued, local authorities needed new sources of revenues, which Layfield saw as a local income tax (pp. 196–208). This was discussed in a Green Paper (DOE 1981) but has never been seriously considered (Kay and King 1990 at p. 136). Ridge and Smith (1991) provide a critique of the arguments for and against a local income tax in Britain.

The arguments in support of the UK rating system before the 1990 reforms were clearly set out in the Layfield report, and the property tax, according to Layfield, had many benefits. It could easily meet Smith's Canons of Taxation (see 3.3) in respect of efficiency, certainty and convenience. Notably absent from the list is the question of equity, which Layfield linked closely to accountability. In 1969, the Representation of the People Act had abolished the rights for non-resident property owners to stand in local elections and to vote in local elections. When the level of business rates was set by the local authority, there was no accountability to the businesses paying the tax (until the 1984 Rates Act introduced a new statutory duty on the rating authority to consult with representatives of business before setting the rates or a precept).

## 5.4 THE GREAT RATE DEBATE

Immediately after Layfield there was a Green Paper (DOE 1977), followed in 1981 by *Alternatives to Domestic Rates* (DOE 1981). For a discussion of the post-Layfield government attitude see Prest (1982), Crawford and Dawson (1982) or Travers (1986).

For business rates there followed a period of inactivity on the part of the government, with no substantive action until 1986, when an important Green Paper, *Paying for Local Government* was published (DOE 1986b). The publication of this Green Paper heralded a new and important chapter in the controversy about rates, culminating in the 1990–93 reforms of the local government taxation.

The main proposal in the Green Paper for businesses was the replacement of locally set rates on business property with a centrally set Uniform Business Rate. In response to this proposal a flood of academic papers, as well as less objective commentary, was published: nearly every major firm of surveyors and special interest group had something to say on the subject.

The CBI passed a resolution at their annual conference hostile to the government plans for a nationally set business rate (Independent 1987). They proposed that business should contribute only towards the local cost of those services that benefit them directly (CBI 1987). In other words, the CBI wanted the UK business property tax to be changed to a specific benefit tax (see 3.3.4).

Examples of the typical responses to the Green Paper and the subsequent legislation can be found in RICS (1989), Institute of Directors (IOD 1986), Edward Erdman (1987) and Fuller Peiser (1987). Blair (1989) summarises contemporary debate, taking account of arguments on both sides of government and the business lobby. A critical evaluation of the arguments for and against the proposed reform is given by Midwinter and Mair (1987).

The most significant criticism of the new system was that it 'totally undermines any link of local authority and local business' (Bennett 1988 at p. 152). This criticism came from across the political spectrum. The Institute of Directors (IOD 1986) despaired 'at the possibility of ever achieving any effective relationship between the local business community and local government', whilst Westminster City Council (1986) concluded that 'the link between local business and local government would be effectively broken'.

## 5.5 RATE DIVERGENCE AND CENTRAL CONTROL

The economic crisis of the mid 1970s brought to an end a long period of expansion of public services in Britain (Travers 1987), especially in the local government sector. In the period between 1961 and 1975 there was a rise of 69% in local government employment. This compared to an increase in central government employment of only 9.4% in the period 1965 to 1974 (Midwinter and Mair 1987 at p. 63).

From 1979, the government was determined to exercise tight control over public expenditure. During this period there was a change of emphasis away from the development of local services towards control of grants, expenditures and individual rate levels. Between 1975–6 and 1981–2, local authority spending fell by 4% per annum in real terms and, between 1980 and 1995, employment levels in local government fell by 15% (OECD 1997a).

That rates were unpopular with business is well documented (Birdseye and Webb 1984; DOE 1986b) and the government used this unpopularity to bolster its arguments for controlling local expenditures. The following controls were introduced by central government between 1980 and 1985:

1. the use of grant penalties based on the extent to which local authorities overspend their targets or central government guidelines;

2. the acquisition of rate capping powers against individual local authorities in cases of 'excessive or unreasonable' expenditure;

3. the acquisition of general powers of rate limitation that were applicable to all local authorities;

4. the abolition of supplementary rates (explained in A1.3.4).

These measures were viewed by some as draconian (Charman 1989) and by others as an attack on local democracy (Midwinter 1984), but they failed to achieve the reductions in local authority expenditure that were sought.

What they did was to raise the importance of the rating system on the political agenda and strengthen government resolve to introduce reform.

### 5.5.1 CENTRAL GOVERNMENT GRANTS

Earlier in this chapter Figure 5.2 illustrated the growing importance of central grants as a component of local finance. In 1999–2000, they accounted for over 50% of local revenue. The grant system and how the level of grants is set using the Grant Related Expenditure Assessment, are explained in Bennett (1982) for the system as it existed before the reforms of the 1980s, and for the revised system in Ridge and Smith (1991).

Jackson and Meadows (1985) summarised the objectives of the grant system:

1. to compensate authorities for differences in their spending needs;
2. to compensate authorities for differences in their local taxable needs;
3. to reduce the burden which would otherwise fall on local taxpayers;
4. to influence the total composition and distribution of local authority spending.

Figure 5.3 shows the way local authority income sources changed between 1940 and 1990. Although central grants are a growing component of local revenues, grants fell in real terms by 6% per annum between 1979 and 1986 and many increases in the rate burden came about precisely because of cuts to central government grants and the Rate Support Grant in particular.

### 5.5.2 CHANGING RATE BURDENS 1973–1988

Changes in central grants resulted in an equivalent change in the local tax rate. On a national basis, reductions in central grants in the period 1979 to 1985 resulted in a net increase in rate poundages of 11.8p (Bennett and Krebs 1988 at p. 99).

# LONG-TERM TREND IN LOCAL GOVERNMENT REVENUE

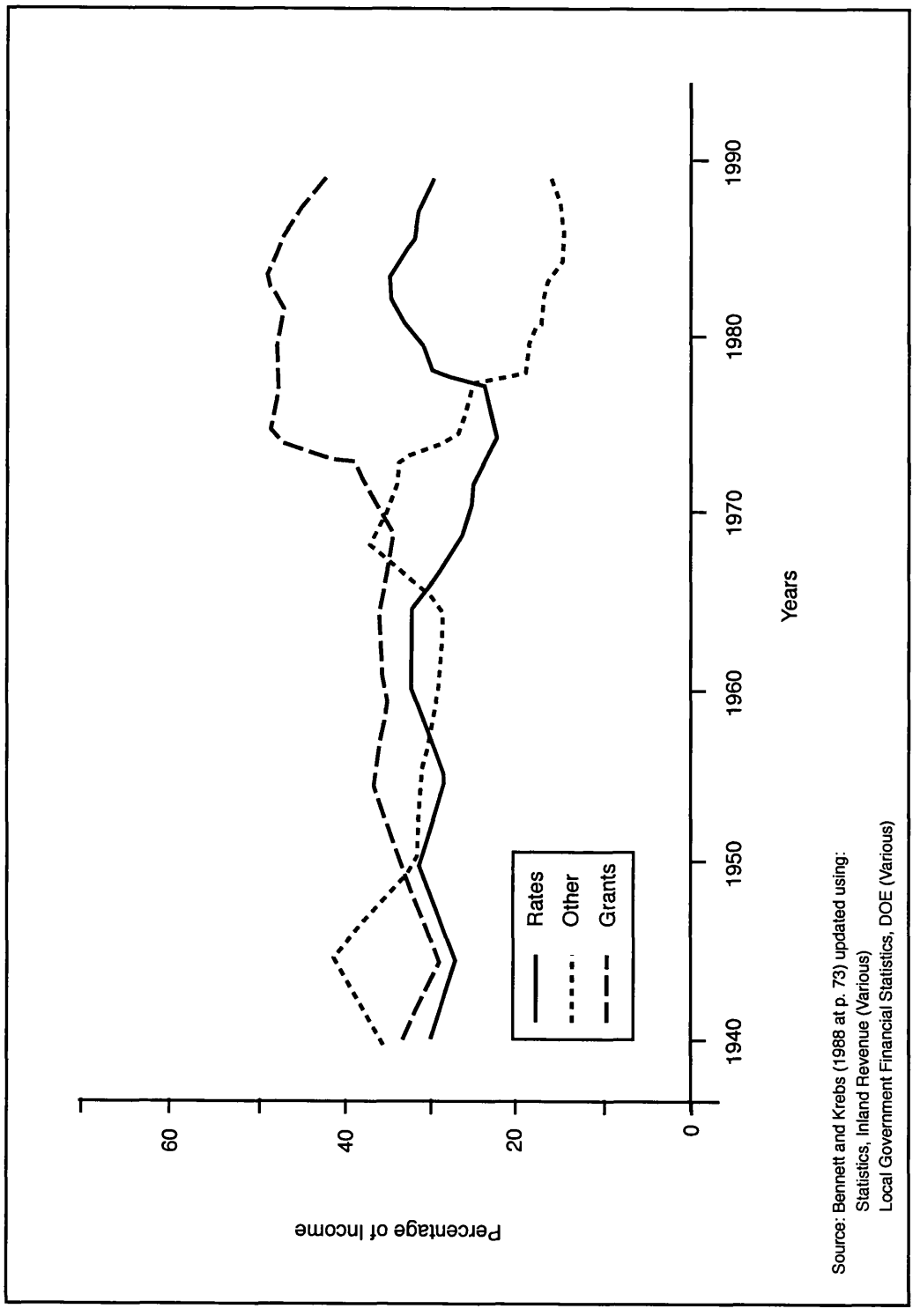



**Figure 5.3: Long-Term Trend in Local Government Revenue**

Over the three years 1978–81, domestic rates rose by 91% (Brown and Jackson 1990 at p. 288), and between 1978 and 1982 business rates rose from 21% to 42% of corporate profits (Bennett 1986 at p. 35).

In the same study, Bennett reports that rate payments by businesses in the period following 1979 increased 15% to 20% faster than other costs and he observes a steady increase in the variability between local authority areas, resulting in wide disparities between locations (at p. 36). Despite the evidence of rising burdens, some commentators at that time, especially the local authority associations, were claiming that business rates did not represent a significant problem for business (see for example Hughs 1981, 1983; AMA 1983; Othick 1983; Crawford et al. 1985). A close look at the arguments reveals that, for the most part, they are based on the premise that rates represent only a small proportion of total business costs. Whilst it may be correct that rates are a small proportion of total costs, if they are increasing fast, they can still have a major impact on profitability due to the gearing effect (see Appendix 3).

The impact is likely to be different for different sizes and types of business. It may be possible to minimise the impact of differing burdens for nationally based or multi-branch businesses, but for small businesses the problem is more serious. Small businesses paid £5.4 billion in business rates in 1994–5 and this represented 22.9% of the total burden of taxation on the small business sector (Chittenden et al. 1999). This suggests that rates make up a bigger proportion of total costs for small businesses.

A further problem is the extent to which a higher level of services is enjoyed by the taxpayers in return for a high rate burden. This is a central issue in assessing the impact of a tax (see 3.4.2), since a tax that benefits the taxpayer by the amount of the tax itself is no longer onerous. For business rates, it seems certain that rises in rate burden did not translate to equal rises in benefits. The increases came about from a need to replace other forms of revenue, such as falling grants. Nor can it be assumed that differing tax rates between jurisdictions gave better benefits to business taxpayers in the high rate area. In this case it is suggested that the higher level of

benefits in high rate areas flows to the residential sector and gives few, if any, benefits for businesses. This important question of benefits received by business rate payers is discussed further in 6.4.

The conflict between central and local government that is illustrated by the rate discrepancies can also be viewed as a consequence of a redistributive desire on the part of local government. It is not desirable to have more than one level of government engaged in redistribution of income and wealth and this role is usually reserved for central government, in order to avoid conflicting goals in this area of normative judgments. In some cases, local authorities used high levels of expenditure as a means of offsetting the distributional effects of central government policies. This in turn led central government to implement more extreme policies than would be in place if the two were working cooperatively (Kay and King 1990 at p. 141).

## 5.6 POLITICAL DIMENSIONS

An internally consistent set of principles for efficiency in the public sector can be elaborated without the need to consider the political process (Buchanan 1975). In this thesis, little attention is paid to the politics of either central or local government, but it is useful to differentiate the political composition of local authorities if only to explain the increasing disparity of business rate burdens that emerged during the period 1979–1988.

Local Government was '... the *bête noire* of the Thatcher administrations during the 1980s' (Johnson and Pattie 1996) and the main source of conflict was between Conservative central government and Labour controlled local councils, especially the so-called 'new left' authorities. Boddy and Fudge (1984) and Gyford (1985) both give a very complete analysis of the issues and, for a summary of the political arguments on both sides, see Newton and Karran (1985).

Bennett and Krebs (1988 in Appendix 3) make an analysis that 'seeks to differentiate by objective criteria the political character of the main groups of local authorities which have steadily deviated from the modal distribution of

tax rates'. Whilst recognising the problems of defining political characterisations with accuracy, the authors do identify a subgroup of Labour areas that can be classified as 'new left', which defines the distinctive behaviour of the high tax local authority areas in the 1980s. They are concentrated in city centres and other highly urbanised areas and all except one were rate capped. Bennett and Krebs conclude that 'there can be no doubt that the "new left" phenomenon as a whole is a major factor in the development of the extreme range of rate poundages since 1979' (at p. 106).

There were nine 'new left' authorities identified in London, including Haringey, Brent and Camden, which are the three high rate London boroughs that are used for the empirical work in this thesis. The important point about these three 'new left' boroughs is not just that they imposed high rates, but they are located adjacent to boroughs with Conservative councils who were setting below average tax rates.

The London Borough of Camden has been the subject of two historically based case studies that give a careful analysis of the political tone (Vielba 1992; Marinetto 1997). These authors make clear the process of politicisation that led to the 'new left' administrations and give an insight into the tension between central and local government, which existed long before the emergence of Thatcherism in central government politics.

## 5.7 SIX LONDON BOROUGHS

The London boroughs were constituted under the Local Government Act, 1963 and came into operation in 1965, (see 5.2.1). Six London boroughs have been selected for the empirical research.

The selected local authorities are the London boroughs of Barnet, Brent, Camden, Enfield, Haringey and the City of Westminster. Of these six, Brent, Camden and Haringey are high rate boroughs and Barnet, Enfield and Westminster are low rate boroughs.

# MAP OF SIX LONDON BOROUGHS USED IN THE STUDY



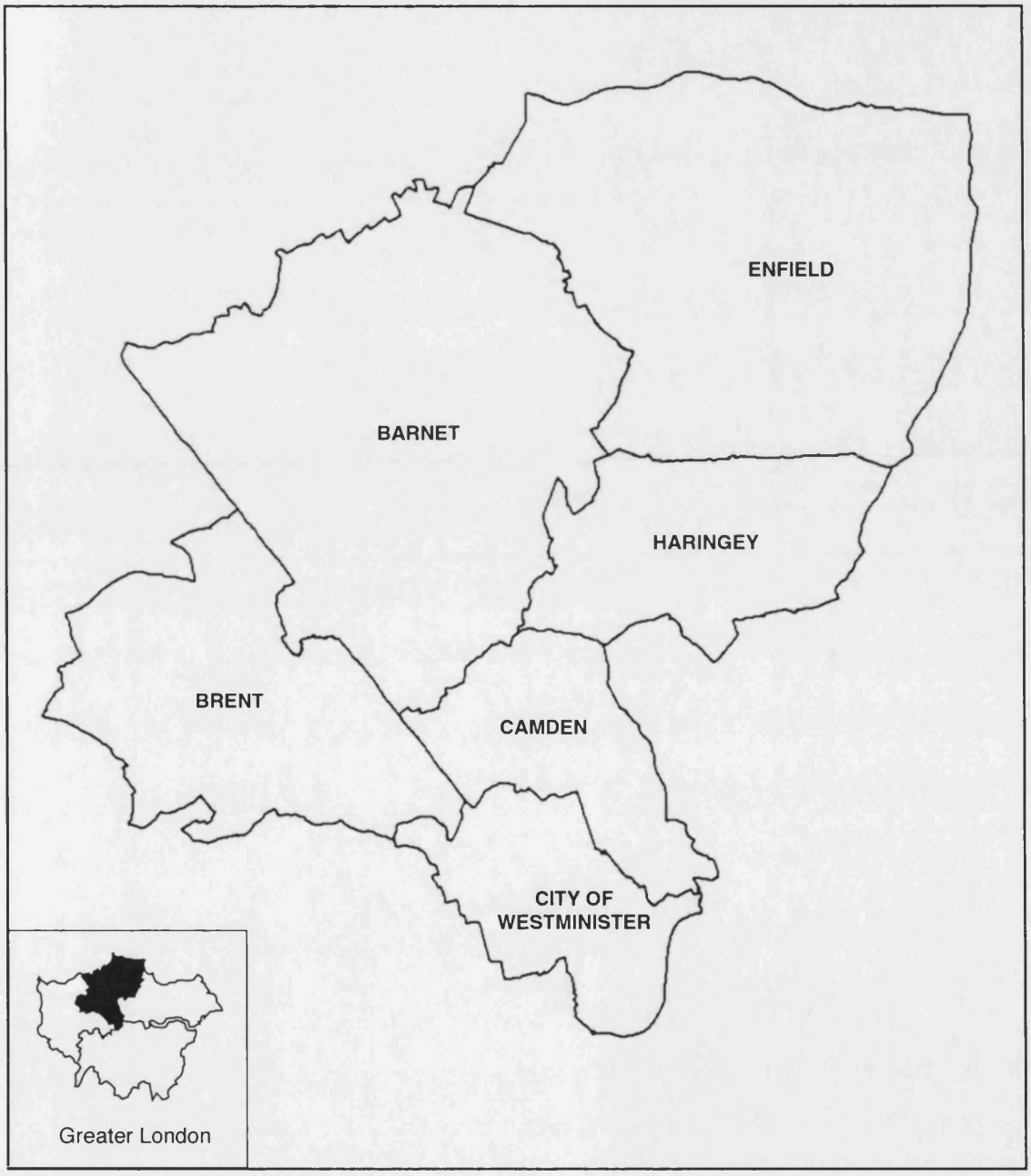



**Figure 5.4: Map of Six London Boroughs Used In The Study**

Figure 5.4 is a map showing the six boroughs and their relationship to each other. The boroughs are paired together, so that there is a match between a high rate borough and a low rate borough; a study of a single property type is then made for each pair of boroughs.

Enfield and Haringey are paired for a study of industrial property.

Barnet and Brent are selected for the study of retail property.

Westminster and Camden are used for the study of office property.

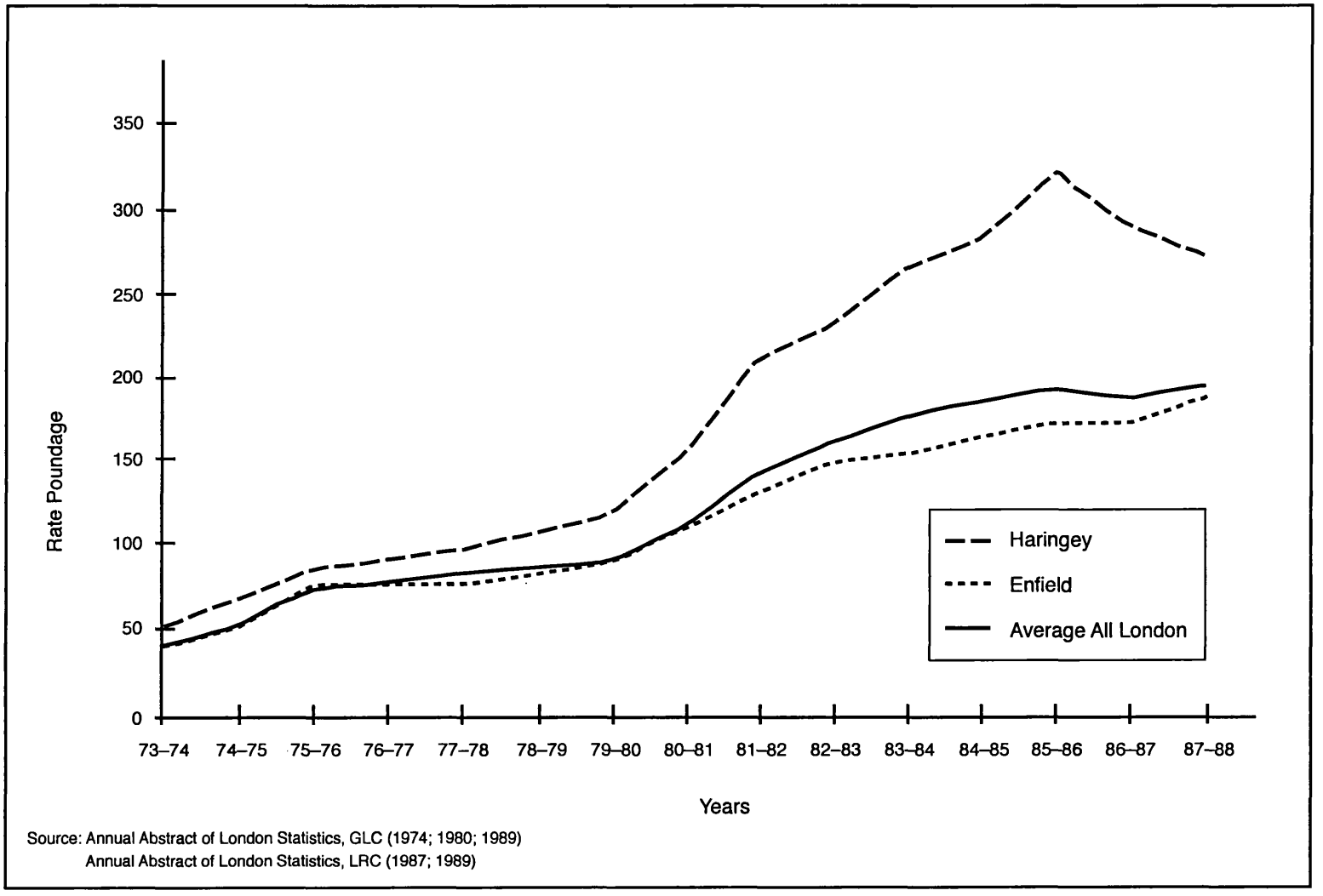
Further information on the design of the empirical research is given in Chapter 6 and the data collection for the districts selected is explained in 7.6.

Figures 5.5, 5.6 and 5.7 show the way rate burdens between the selected pairs of boroughs diverged between 1973 and 1988.

In 1974, rate poundages in London were within 8% of each other, except for inner London, which had a rate poundage 20% below the average. This is because of the dominance of the City of London, Westminster and some other inner London areas that have a much higher tax base (based on property values), and this allowed these local authorities to set low rate poundages.

For all three pairs of boroughs there is a progressive divergence of rate poundages, which becomes more marked after 1979. The divergence is clear in Westminster/Camden from 1976–7 onwards and in Enfield/Haringey from 1978–9 onwards. In 1978–9, rate poundages in Barnet/Brent were still in line with each other, but by 1988 the uniform pattern has been replaced in all three areas by the widely differing rate poundages that are illustrated by the figures.

The impact of rate capping on high rate boroughs stands out, in Brent from 1983–4 (Figure 5.6) and in Haringey from 1985–6 onwards (Figure 5.5).




Source: Annual Abstract of London Statistics, GLC (1974; 1980; 1989)
Annual Abstract of London Statistics, LRC (1987; 1989)

**Figure 5.5: Rate Poundage–Enfield/Haringey**

RATE POUNDAGE–ENFIELD/HARINGEY

Figure 5.5

# RATE POUNDAGE–BARNET/BRENT

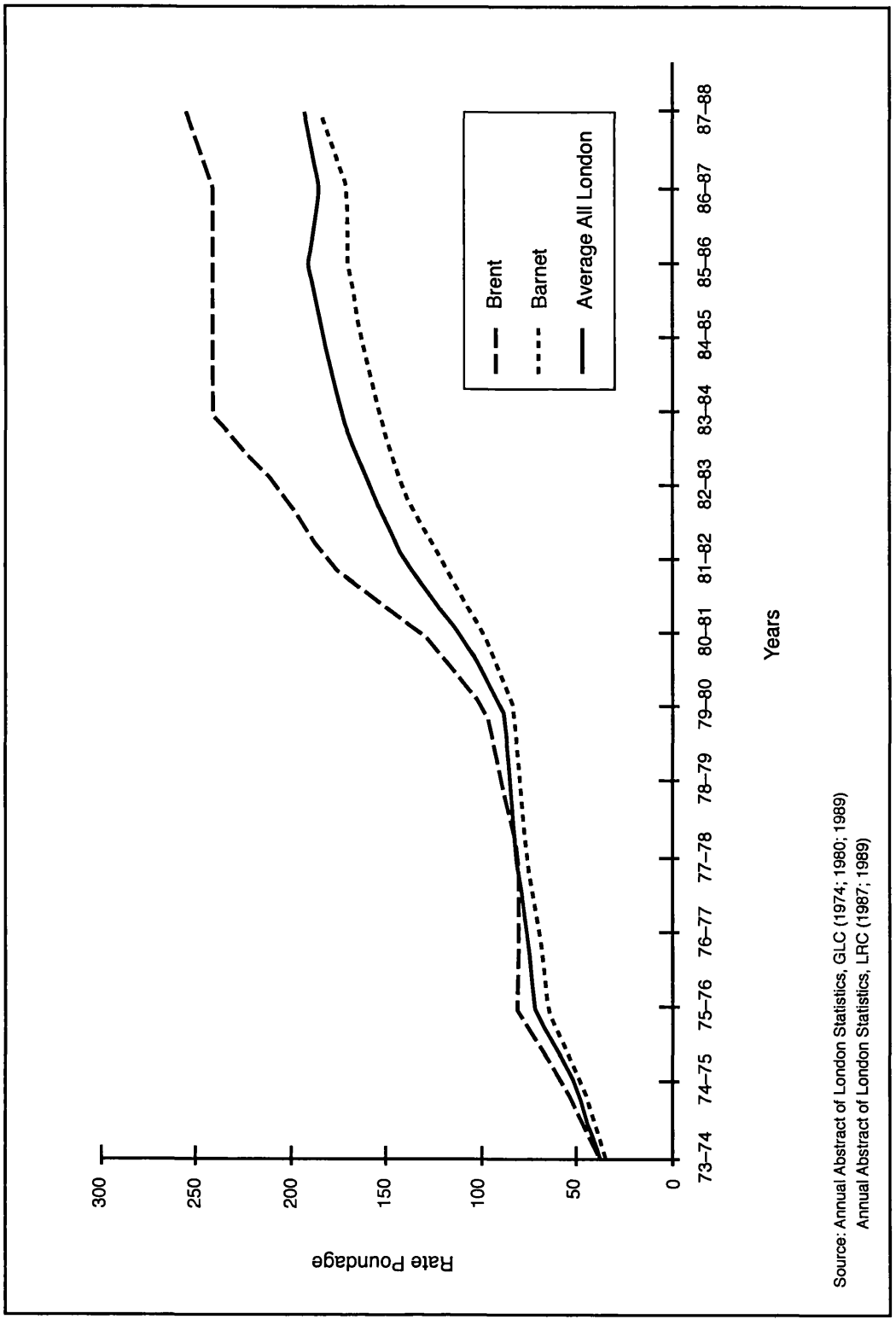
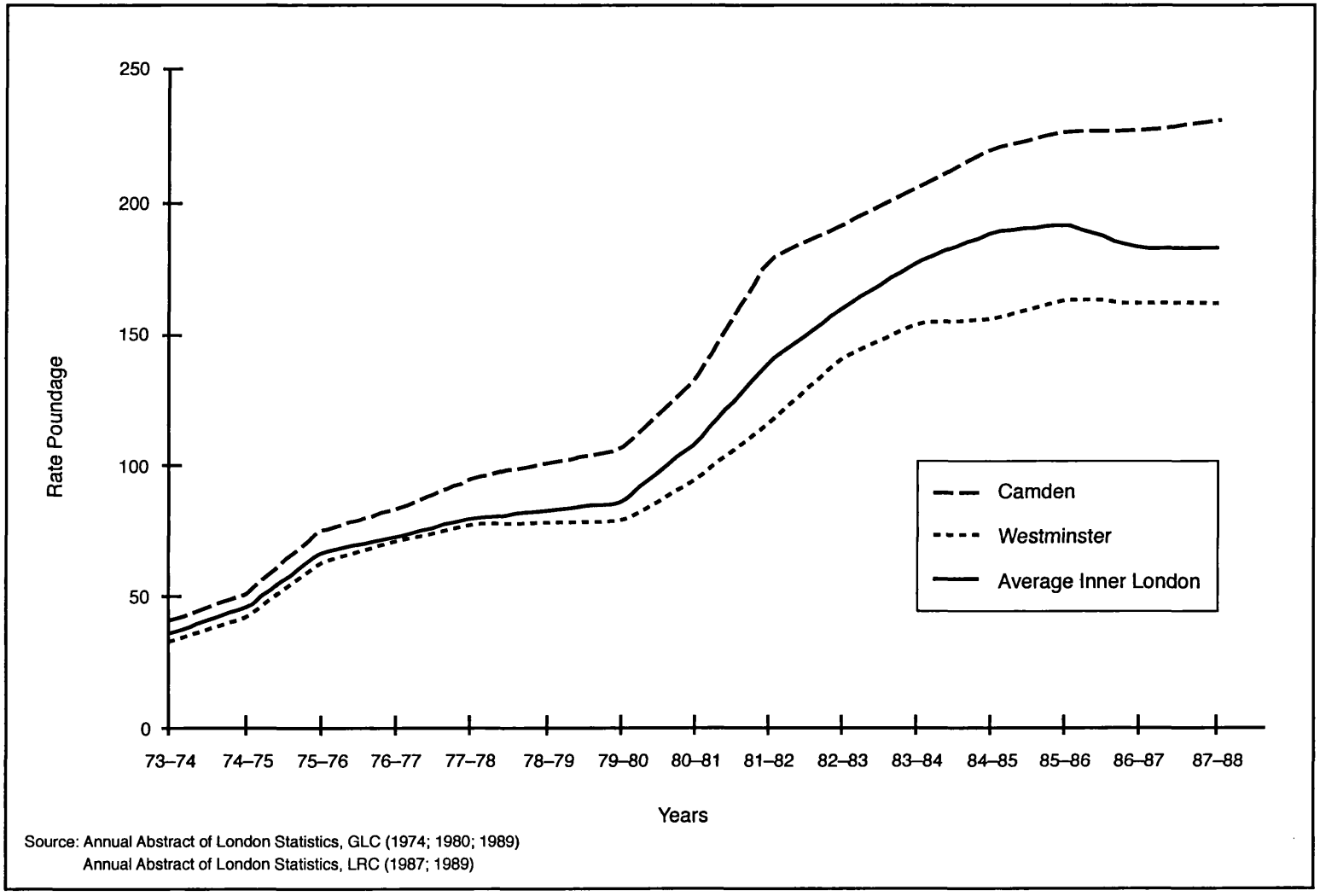



**Figure 5.6: Rate Poundage–Barnet/Brent**




Source: Annual Abstract of London Statistics, GLC (1974; 1980; 1989)
Annual Abstract of London Statistics, LRC (1987; 1989)

**Figure 5.7: Rate Poundage–Westminster/Camden**

RATE POUNDAGE–WESTMINSTER/CAMDEN

Figure 5.7

### 5.7.1 LONDON BOROUGH OF ENFIELD

The borough was formed from the district councils of Enfield, Edmonton and Southgate and part of the county of Middlesex, which, being fully urban, was abolished as part of the 1963 reforms.

Enfield is an outer borough, forming part of the northern edge of London and contains large tracts of industrial property in the Lea Valley. The borough had a stock of 1,174,000 $m^2$ of industrial floor-space in 1994, representing 65% of its total business property. Shops and offices made up 25% and 10% respectively (ONS 2001).

Between 1968 and 1994 there was an unbroken period of Conservative control and until recently the political character of the borough had been predominantly Conservative. There have been two periods of Labour control: one took place during the first administration at the time the council was formed, and between 1994 and 2002 the council was Labour controlled (see Table A5.1).

### 5.7.2 LONDON BOROUGH OF HARINGEY

Haringey was formed from the old boroughs of Hornsey, Tottenham and Wood Green. It is classified as an inner London borough, with part of the Lea Valley industrial area to the north-east of the borough.

In 1994 the borough had a stock of 815,000 $m^2$ of industrial floor-space. This was 60% of the total business floor-space in the borough with the balance being made up of 30% shops and 10% offices (ONS 2001).

The only period of Conservative administration in the history of the borough took place during the first two terms between 1965 and 1971, immediately after the borough was created. Since 1971 control has been with Labour, who have enjoyed a large majority, winning 42 out of 57 seats in the 2002 local council elections, with no Conservative seats (see Table A5.2).

### 5.7.3 LONDON BOROUGH OF BARNET

Four boroughs were merged to create Barnet: East Finchley, Hendon, East Barnet and Friern Barnet. The borough is an outer borough, to the north of London. Minor boundary changes in 1996 to the northern boundaries of the borough do not have any effect on this study.

Shops made up 40% of the total business floor-space with 538,000 $m^2$ of space in 1994. Offices represented 25% and industrial 35% (ONS 2001).

Barnet was Conservative controlled from the formation of the borough until 1994, since when it has had a Labour administration with Liberal Democrat support. In the 2002 elections the Conservatives again won a majority. The largest Conservative majority was 53 in the 1968 elections and throughout the 1970s and 1980s the Conservatives held majorities of between 21 and 39 seats (see Table A5.3).

### 5.7.4 LONDON BOROUGH OF BRENT

Formed from the boroughs of Willesden and Wembley, Brent is classified as an outer London borough, although all of its boundaries are with other London boroughs.

Shops had a total floor-space of 426,000 $m^2$ which was 20% of the total business property in the borough in 1994. This figure includes the Brent Cross shopping centre, which, at that time, was 24,320 $m^2$ representing nearly 6% of total retail space in Brent. Industrial property made up 66% of the remaining total and offices 14% (ONS 2001; Standard Life 2002).

Conservative controlled until 1971, Brent has been under Labour control ever since. The Labour administration has been supported by Liberal Democrats for two periods, the first between 1982 and 1986 and again between 1990 and 1998. The largest Labour majority of 20 was gained in the 1986 elections (see Table A5.4).

### 5.7.5 WESTMINSTER CITY COUNCIL

Westminster became a City in 1902 but, unlike the neighbouring City of London, it has the administrative status of a London borough. Formed from three local authority areas, Westminster, Marylebone and Paddington, the borough is a city centre authority with a high value property base.

Over 65% of the business property (by floor-space) was made up of office accommodation, represented by 4,241,000 $m^2$ in 1994. The remainder was mostly made up of retail property, with only 4% of the total being industrial property (ONS 2001).

Westminster has been under Conservative administration since it was formed. The Conservative council had its largest majority of 50 seats in the 1968 elections, which was reduced to its lowest level of 2 seats in 1990. The Conservative majority currently stands at 36 (see Table A5.5).

### 5.7.6 LONDON BOROUGH OF CAMDEN

Formed from the prosperous boroughs of Holborn and Hampstead and the relatively deprived St Pancras, Camden is an inner London borough, which includes large parts of central London to the south, including Bloomsbury, Holborn and the Kings Cross and Euston area.

There was 2,908,000 $m^2$ of office property making up 60% of the total business property floor-space in 1994. This is concentrated in the southern part of the borough. The remaining floor-space was split evenly between shops and industrial (ONS 2001).

Camden was controlled by Labour from 1971 onwards, with only a single term of Conservative administration in the borough following the 1968 local elections. Majorities have varied over the years of Labour control with the lowest being 7 seats and the highest 35 following the 1994 elections (see Table A5.6).

## 5.8 CONCLUSIONS

The rating system is just one part of the of local government finance system and, throughout the 1980s, it was the subject of vociferous debate, political wrangling and much legislation. The central problem was that continual increases in demands for local services had to be matched against the limited sources of local government revenue. This culminated in the introduction of the Uniform Business Rate in 1990, the most far-reaching change to the rating system for over 70 years.

The exceptional circumstances that led to the 1990 reforms provide a unique opportunity to study differing tax burdens between local authority areas and this opportunity has effectively been removed by the reforms themselves, which introduced a unified national rate of tax.

The differing rate burdens that were in effect for several years prior to 1990 provide an ideal set of conditions to identify the impact of business rates on rental values. This is expected to manifest itself through different rates of rental value growth between the paired London boroughs selected for this study.

In the next chapter the research framework is developed. It is based on the theoretical background, which was explained in Chapters 2 and 3, and it draws on the previous empirical work discussed in Chapter 4.

# CHAPTER 6

# METHODOLOGY AND DATA REQUIREMENTS

## 6.1 INTRODUCTION

The empirical study that is carried out for this thesis examines the effect of business rates on business tenants and property owners. Chapters 2 and 3 set out the theoretical background to the thesis, while Chapter 4 examined the existing empirical literature. Chapter 5 explained the political background to the rating system in the UK and identified the six local authorities in London that were selected as the subjects for the empirical research.

This chapter explains the research design, the methodology adopted and the data collection approach that is employed to answer the chief question posed by this thesis: to what extent is the UK property tax shifted backwards into rents and thereby capitalised? The basic approach to the empirical work is an inter-jurisdictional micro-level study of property tax incidence using the circumstances of tax change. Figure 1.1 showed the time frame of the empirical research.

## 6.2 DEFINING THE RESEARCH QUESTION

The essential problem is whether or not differences in property tax rates are reflected in the values of the properties to which they apply. Underlying this research is the hypothesis that property values over time will be lower in areas where there is a higher tax burden, subject to any differences in the benefits received in payment for the tax.

In defining the research hypothesis, careful account is taken of the theoretical factors that were considered in Chapters 2 and 3. The research design and methodology selected make reference both to the determination of property values and the analysis of tax incidence.

The central research problem has been set out in the literature on many occasions and several precise formulations have been made in studies of property tax incidence. In a UK context, the research problem was clearly explained in theoretical terms by Bennett and Krebs (1988), and it was

developed empirically, in the framework of a property based micro-level study, by Sibley (1989). The statement below expands on that formulation.

> Consider two identical properties, situated in close proximity to one another and having the same access to transport links and other relevant amenities. Each property will represent a close substitute for the other. They will be equally attractive to prospective occupiers and rental value will tend to be the same for both buildings. It follows that rateable values will also tend to be the same because they are assessed according to the rental value of the property.
>
> Now assume that these properties are located on either side of the boundary between local authority areas and the respective local authorities have widely differing rate poundages. The business rates payable by the occupiers will be different and the property in the high rate area will suffer from higher occupation costs.
>
> The two properties, although otherwise identical, are no longer equally attractive to occupiers and, assuming an efficient property market, rental values in the high rate area can be expected to fall to a level where total occupation costs are equalised, subject to any differences in benefits received by the taxpayer.

In order to test the hypothesis that total occupation costs are equalised, it is necessary to identify properties that closely match the above scenario. Figure 6.1 provides an illustration of these circumstances for retail property in the London Boroughs of Barnet and Brent.

It is assumed that the circumstances above exist under the pre-1990 rating system. It has already been seen that property markets offer 'efficiency over time' rather than immediate adjustment to changing market circumstances (see 2.6.3). In previous studies 'property market responses have been found to operate with a considerable delay' (Bond et al. 1996a at p. 29). This is a function of the institutional arrangements that are found in the UK and the structure of the business lease is part of the explanation for this phenomenon (see 2.6.5). The general level of rental values in the high rate area cannot readily adjust to compensate for higher total occupation costs, so that

# EXAMPLE OF A BOUNDARY BETWEEN BOROUGHS

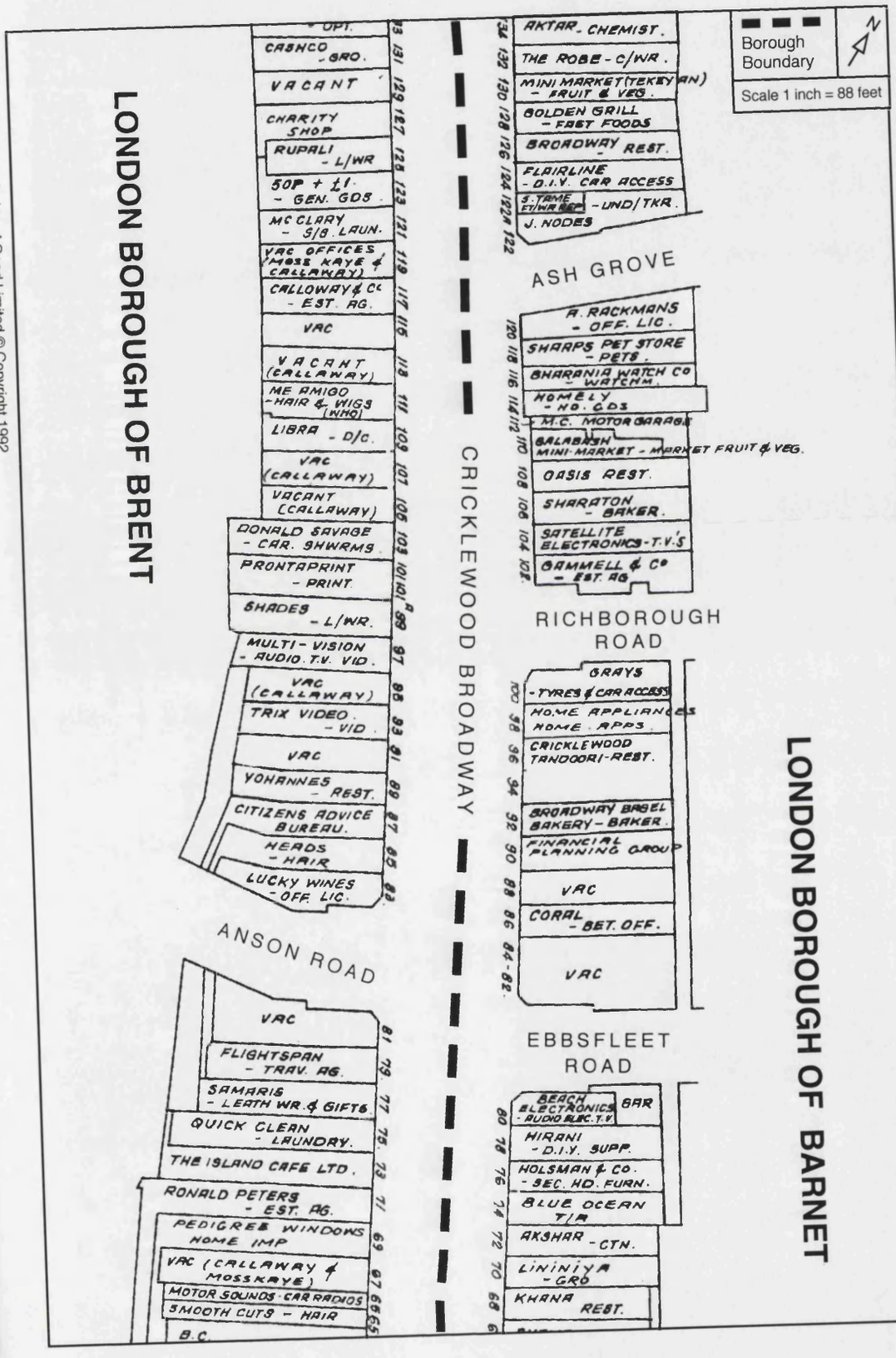



**Figure 6.1: Retail Properties on Either Side of Barnet/Brent Boundary**

changes in the levels of value between areas (under conditions of rental value growth) will tend to come about through differing annual rates of rental value growth. Even when dealing with new lettings and renewals, this process is not instantaneous and it can be described as a 'slowly changing spatial relationship' (Bennett 1980 at p. 97). Such relationships can only be observed after a sufficient length of time has elapsed.

The central problem can be stated in the form of a research hypothesis as follows:

> *Following a period of years during which differing property tax burdens are applied to otherwise comparable properties, the rental values of those properties will adjust to a level whereby total occupation costs are equalised.*

This hypothesis disregards the question of tax benefits, which is considered at 6.4 below, but first it is useful to recap on how the expected equalisation can occur. The theory of rental value determination was considered in Chapter 2, together with the residual nature of rent and an analysis of demand and supply differences between property types.

Occupation demand for property is determined by the expected profitability of running a business in a particular property. Increased costs in the high rate area will reduce the level of occupation demand and this will manifest itself in two ways: existing tenants can vacate their premises when their leases expire and prospective tenants will look for lower rents in such areas when seeking premises. This reduction in demand will in turn result in an increase in supply which will bring about a corresponding fall in rental values.

The extent to which equalisation will take place will be strongly influenced by the property type. The degree of equalisation will in part be determined by the price elasticity of occupation demand and the elasticity of demand is affected by the availability of substitutes, which will vary for different property types. A manufacturing firm could, perhaps, locate anywhere in the South-East, and could certainly locate anywhere in the same industrial estate but the same could not be said for retail occupiers.

The supply elasticity of the particular property type will also have an influence on the extent to which the expected results are likely to be observed. Supply for all three property types can be regarded as inelastic within the selected London boroughs at the time of the chief empirical analysis in this thesis. This is a function of the urban location and local planning policies (see 2.8).

The residual nature of rent is also affected by property type. The relationship of profitability to occupation demand is strongest for retail premises and is likely to be weakest for office properties. This would suggest that the strongest results will be found for retail property, but in practice the institutional lease isolates the rent from price shocks, such as changes in other occupation costs. This will lengthen the time frame required for the observation of any change.

Finally, the proportion of rates as part of the occupier's total costs can also be expected to influence the extent of equalisation. If the rate burden is a small proportion of costs, then the impact on rent (or other shifting effects) will be less.

## 6.3 TELEPHONE SURVEY OF PROSPECTIVE OCCUPIERS

In order to explore the proposition that a higher tax burden will result in lower demand for properties in that area, a small-scale telephone survey was carried out on prospective occupiers in Enfield and Haringey.

The survey was focused on identifying the importance to occupiers of rates as a business cost. It also sought to identify whether occupiers perceived any differential benefits arising from being in one local authority area over another. Another area that was investigated in the survey was the extent of occupiers' knowledge of the (then) forthcoming system of Uniform Business Rates. A full analysis of the survey results is set out in Appendix 6.

The telephone survey confirmed that business occupiers are likely to take account of rate burden in making their location decisions. Prospective occupiers showed a strong aversion to high rate areas, which supports the validity of the central hypothesis of this thesis.

No occupiers identified any tax benefits that were received in exchange for the tax payment beyond those that were common to all local authorities.

There were other non-tax preferences that affected the choice of location, such as political inclination and perceived disadvantages in the implementation of planning policies in some local authority areas.

The questions about knowledge of the new rating system were intended to see if there was any need to account for the rational occupier *with perfect knowledge,* who would already have adjusted their rental bids to take account of the expected future changes to rate burden. The survey suggested that knowledge of the new system of Uniform Business Rates was quite limited in November 1989.

This was consistent with the survey of retailers by Crosby and Keogh (1990) in Nottingham who found that 'very few firms claimed to have taken any action in anticipation of the change' (at p. 22).

A more recent survey (DOE 1995a) of 1,500 occupiers, carried out in 1993, found that 'almost three quarters of firms (72%) claimed to be aware of the Uniform Business Rate' (at p. 55). The corollary of this finding is that, even three years after the new system was introduced, 28% of business occupiers still did not have any knowledge of the new system.

## 6.4. BENEFITS TO THE TAXPAYER

Business rates are paid by occupiers to finance local services, but the relationship between the payment and the benefits received is a tenuous one. The services received by taxpayers have included refuse collection, local road maintenance, police and fire services, local education services, some transport services, social services, libraries, leisure and recreational facilities.

For the purpose of this research, the important question is whether there were differential benefits between high and low rate boroughs, which reflected the differences in property taxes on businesses. The key services

of interest to business occupiers are refuse collection and security (fire and police). For the most part, the other local services are of the greatest benefit to the residential sector of the local population. This issue was also discussed in 5.5.2, where the conclusion was that the improved services in the high rate boroughs tended to benefit the local residential sector. If the employees of a business reside in the same local authority area as the firm, it could perhaps be argued that the business gains benefit to its workforce from higher business rates, but high employee mobility between local authority areas in London weakens this link considerably.

By the late 1970s, most London boroughs had removed trade refuse collection from business rates and made it a chargeable service. All six boroughs used in this empirical research made a separate charge for refuse collection in addition to the business rates. Occupiers in these boroughs were also free to arrange for refuse collection from one of a number of private sector suppliers as an alternative to the local authority service. This meant that there was little incentive for occupiers to locate in one borough over another due to either free or better refuse collection services.

In London, the Fire Service has been provided by the London Fire Brigade (LFB) across the whole metropolitan area since 1948 and this was financed by the rate precept, charged first by the LCC and, until 1986, by the GLC. After 1986, responsibility for the LFB passed to the London Fire and Civil Defence Authority and financing was still through a rate precept. Again, there is no differential benefit attributable to any individual local authority area.

Similar arrangements apply to the Metropolitan Police Authority, which is financed and managed on a London-wide basis through a rate precept, although in this case with local level management via Borough Operation Command Units. The City of London Police is a separate force and not part of the Metropolitan Police Authority.

The London Ambulance Service has been the responsibility of the National Health Service (NHS) since 1974. This service, and other local health services that are part of the NHS, are not financed by local taxes.

The telephone survey carried out as part of this research did not find that prospective occupiers considered any borough to provide better services than any other (see 6.3 and Appendix 6). The overwhelming concern of occupiers was the size of the rate bill and it is suggested that any marginal differences in the quality of services in the high rate boroughs that might benefit businesses (such as better libraries) are outweighed by the substantially higher rate burden.

It is reasonable to assume that, for London boroughs, the important business-focused services are homogenous between boroughs, regardless of rate burden (and political persuasion of the local authority). There has been a progressive tendency to centralise government services and this has reduced the scope for local differentiation. In fact, for England as a whole, 'local authorities have much less freedom to vary the level of services they provide' (Evans 1985 at p. 169), when compared to other countries, such as the US, and compared to freedoms enjoyed in the past.

It is concluded that any differential benefits between local authorities used in this empirical work can be safely ignored. The benefit effect is considered to be fiscally neutral between boroughs and therefore no explicit public sector variables will be used in this work.

## 6.5 RESEARCH DESIGN

Many factors were taken into account when designing the research methodology. In choosing a design for this research, two main principles were kept in mind:

> that the design must be structurally congruent with the research question;
>
> that it must be compatible with the available resources, especially the availability of data to complete the study.

Spector (1981 at p. 32) commends a cross-sectional design for field studies where the data are difficult to acquire or control and this is the underlying approach to the data in this work.

The primary analysis undertaken for this research uses cross-sectional data at 1st April 1988 and analyses the information to see if any statistically significant causal relationship exists between rate burden and rental value.

In the standard cross-sectional design, data are collected at one point in time and this can give rise to problems in establishing cause without a time dimension (de Vaus 2001 at p. 177). The adoption in this thesis of a *Pre-test/Post-test* design (Graziano and Raulin 1997 at p. 221), addresses this flaw, strengthening the standard approach, to allow comparison between two points in time ($T_1$ and $T_2$), even though the underlying approach is cross-sectional.

The cross-sectional data at April 1988 ($T_2$) represent the Post-test data but, for the Pre-test/Post-test design to work, data must also be collected at an additional point in time, before significant tax rate differentials were present. The date selected for the Pre-test data collection ($T_1$) is 1st April 1973. This makes it possible to test whether the properties in each area were drawn from the same population before the emergence of high tax differentials, an assumption that underlies the research design.

The logic of the experimental design is based on the following two conditions:

> the areas under study are the same in all relevant respects at $T_1$ before the emergence of rate differentials;
>
> the areas under study experience the same conditions between $T_1$ and $T_2$ except for the emergence of rate differentials.

The research hypothesis to be tested was set out in 6.2 above. If either of these two conditions is not met, then there are alternative plausible hypotheses that could account for the differences between the areas under study (de Vaus 2001 at p. 56).

The long time period is expected to allow the impacts of the differing tax rates to work through to differences in rents. It is a basic prediction of this thesis that rental values will adjust to reflect differing rate burdens. The assumption underlying the Pre-test design is that, in 1973, for any pair of

boroughs, the two sets of observations represent different data drawn from the *same* population. The Post-test analysis for tax capitalisation is based on the corresponding set of measurements for the outcome variable of rent in 1988. If these observations can be shown to have been drawn from *different* populations after the rate burden has diverged, then the tax can be shown to have been capitalised (as long as the direction of change is consistent with the predicted outcome).

Whilst the additional 1973 data do not allow for a time series analysis to be carried out, they do give a longitudinal dimension to this study. A secondary analysis was made to introduce an additional longitudinal dimension to the study and to extend the time horizon beyond the 1973–1988 period. This secondary analysis is a test of rental growth in the period 1988–1998, following the introduction of Uniform Business Rates: it is not as rigorously specified as the primary analysis and is explained in 8.8.

The Pre-test/Post-test design is an adaptation of the experimental method. Fisher (1966) is still the classic description of the modern approach to the experimental design, but the techniques of statistical inference evolved for controlled experiments are inappropriate for social sciences (Bennett and Wrigley 1981 p. 8). The data available for this study will be field data rather than laboratory data (Friedman and Sunder 1994 at p. 7), which necessitates relaxations to Fisher's method and the design adopted might be more accurately described as a *'quasi-experimental design'* (see Cook and Campbell 1979 or Shadish et al. 2002).

The experimental methodology involves the application of *treatments* to the independent variables identified as *causes*, to determine their effect on the dependent variable (the *outcome* variable). Within this research, the treatments are the differential tax rates and the independent variable is the rate burden payable by a particular property. The dependent variable is the rental value, which is predicted to be affected by the differential rate burden.

The approach to the analysis is based on well established *null hypothesis significance testing* procedures. For the primary analysis this involves standard tests of statistical significance, first to test the data in 1973 before

the divergent rate burdens emerged (the Pre-test) and then in 1988 after the divergent rate burdens had been present for a number of years (the Post-test). The statistical analysis procedures are explained in Chapter 8.

The ideal approach controls extraneous sources by randomisation rather than by attempting to hold everything constant except for the one variable under consideration (Brown and Melamed 1990). The empirical research in this thesis does not involve the completely randomised design that is only possible with the true experiment. In true experimental research, subjects are allocated to treatment groups before the treatment is applied to the independent variable and the outcome of the treatment on the dependent variable is measured and later tested. The subjects to be considered in this experiment are individual properties that cannot be chosen or allocated to treatment groups at random. The treatment in this research is the application of different tax burdens to otherwise identical contiguous local authority areas. Like so much social science research, the treatment of interest cannot be applied by the researcher, it can only be observed.

The lack of randomisation in the selection of subjects in geographical research is closely related to what Openshaw and Taylor (1981) call the 'modifiable areal unit problem'. This describes the choice of an arbitrary or convenient zone as a basis for spatial aggregation and analysis, which can invalidate much research in the field. This may be true for spatial units that are chosen arbitrarily on an *a posteriori* basis but, in this thesis, the zones chosen are based on local authority administrative boundaries that are directly linked to the solution of the research question. The zones are not modifiable or arbitrary. They are truly given, *a priori* and so the areal unit problem does not arise. This prior assignment by virtue of the property location removes the possibility identified by Spector of 'bias in the assignment of subjects to treatments' (1981 at p. 27). It is an underlying assumption that the two groups of properties under consideration in each borough were equivalent at the beginning of the study ($T_1$) and this is tested in the Pre-test data analysis.

Changing local authority boundaries was another factor that is related to the modifiable areal unit problem and this was taken into account in selecting the

local authority areas used for the study. During the time period under consideration there were no relevant boundary changes instigated by the Boundary Commission.

## 6.6 MATCHED PAIRS

In this design, matched pairs of properties are identified on either side of the local authority boundary. The use of matched pairs is fully congruent with the research statement set out in 6.2.

Matching is an important part of the methodology adopted and, by using this approach, it was possible to control and resolve data issues that have confounded earlier studies. Shadish (2002 pp. 118–122) provides a discussion of the way in which matching can strengthen the Pre-test/Post-test design. The identification of pairs of properties with closely similar characteristics is a major control on the data but matching suffers from the problem that it needs a large pool of 'subjects from which to draw those with appropriate characteristics' (Lindsey 1999 at p. 112). This has been aptly described by Smith (1997 at p. 326) as 'statistical inefficiency – creating matches ... requires "throwing away" a lot of data' (see 7.6).

Cheshire and Sheppard (2002) comment on the use of matched pairs in the following terms (at p. 4):

> This 'matched pair' method is really a type of hedonic analysis. It is implicitly admitted that many variables or attributes determine the price paid for the complex good and the researcher is simply trying to set up a situation in which the influence of all but one is eliminated.

Hedonic techniques are more commonly applied to residential property and the difficulties associated with the traditional hedonic approach were set out in 4.2.1. Black (1999) recently used matched pairs to good effect in a study of how school quality influences house prices. In an attempt to avoid the problems of omitted variable bias that affect the more usual hedonic regression approach, Black adopts a matched pairs technique, comparing houses on opposite sides of attendance district boundaries.

In the UK there have been few hedonic analyses of business property and this study does not attempt to use hedonic analysis. The decisive problem for hedonic analysis of business property is the availability of data, although some of the assumptions required for a hedonic analysis also do not hold true for business property markets, especially the requirement for perfectly competitive property markets and perfect mobility between locations.

A single market is a prerequisite of hedonic analysis and, for business property, there are difficulties defining the market itself. Dunse and Jones (1998) make the first major hedonic analysis of UK office property, finding that the hedonic model could not be successfully applied, explaining only 60% of the variation in rental price. The methodology adopted in the study (stepwise regression) is open to strong criticism, but the problem of market definition and the presence of sub-markets was a confounding factor. The latest extension to this work resolved some of the difficulties (Dunse and Jones 2002), finding results for one out of four market segments but the author's conclusion is that 'the hedonic regressions for other clustered segments are less convincing'.

There have been notably few studies that use matched pairs in recent years and this is partly because of the popularity of regression models. Smith (1997) evaluates the two approaches, showing that 'when controls are many and treatments are few, matching compares to multi-variate regression analysis in the estimation of treatment effects' (at p. 327).

Designs of the type adopted in this thesis are, in fact, a specialised form of the general linear model but, unlike regression models, classical models of the type employed here are focused on a select few important variables and 'parsimony is built into the model by the nature of its design' (McKee 2002). On the other hand, the statistical model adopted does not allow for standardisation within the model itself and the matched pairs methodology relies on pre-selection. As pointed out by Cheshire and Sheppard (2002 at p. 4), 'the difficulty with the matched pairs approach is that there are no obvious tests to apply to see how well the research design has succeeded'. This limitation is partly addressed through the Pre-test/Post-test methodology used for the primary analysis and this is supported by a secondary analysis designed to help confirm the central research hypothesis. When fortified with

triangulation of the results against market data, it is considered that the limitation is fully addressed.

It was thus decided to use matched pairs and to implement the selection of pairs within a rigorous selection framework. In principle, as was argued above, such a methodology is comparable to the approach used in the best hedonic analyses, but it is far less data intensive. The process of matching the pairs together is fully described in 7.5.

A regression model was used in the pilot study to handle data that were not cross-sectional in their nature (see 8.3).

## 6.7 DATA REQUIREMENTS

Before considering in detail the analytical techniques that are envisaged to test the hypothesis, it is necessary to discuss the data requirements that underpin this empirical research. One of the main factors in the design of this research was to ensure that sufficient data could be collected to ensure that a satisfactory analysis could be carried out.

A primary limitation for much research in the field of real property is the availability of data: there is a dearth of published information and this acts as a bar to research in the discipline. Crosby (1985a at p. 547) notes that, in the analysis of the property market, data are 'limited by lack of centralised sources' and the discussion of existing research in Chapter 4 found that other empirical studies in the UK were hampered by poor or inadequate data. Behind the apparent objectivity of statistical analysis lies a great deal of subjective judgement. In this thesis, particular emphasis has been given to detailed data collection, which has been carried out in the field at the level of the individual property unit. The use of matched pairs was described in 6.6 and is examined in more depth in 7.5. Considerable care has been given to the data collection and verification process and, where assumptions are made about data, these assumptions are subjected to verification themselves, wherever possible.

The data requirements for this study are purely observational, the *treatment* being the existence of high tax differentials between the local areas under study. These observations could be taken over a period of time (time series data) or at a single point in time (cross-sectional data).

Time series data would allow any differences in the annual rates of rental value growth to be identified, but a time series is significantly more difficult to assemble. The only way to achieve time series data would be to make estimates each year of rental value. Market rental values are only established at the point that a property is let or re-let. Lettings or other reviews of rent take place infrequently, typically at five-yearly intervals, so the series of data needed for a time series analysis will not be available unless estimates of rental value are used. This is the normal procedure for portfolio valuations that are carried out annually or, in some cases, quarterly, but the frequency of revaluation can lead to a mechanical exercise based on the updating of previous figures, rather than an *ab initio* valuation. This problem, known as serial correlation, is discussed by Dunse et al. (1998) and it is an important criticism of the IPD data that were used by Bond et al. (1996a).

After careful consideration of both data sources and existing studies, it was judged that sufficient data would not be available for a time-series study and the cross-sectional research design explained in 6.5 was adopted accordingly. This cross-sectional design was specified for the primary analysis and it is supplemented by a secondary analysis that introduces a further longitudinal dimension to the study.

The date chosen for the primary cross-sectional analysis (April 1988) follows several years of differing rate burdens and it is reasonable to predict that any differences in rental growth over the preceding 10 years will have been transmitted to actual rental values. One of the chief problems with the studies considered in Chapter 4 is the short time horizons that were adopted: only the study by Crosby and Keogh (1990) makes the analysis over a long-term time horizon.

The secondary analysis uses a different data-set to the primary analysis: it was not considered practical in a small scale study of this type to try and maintain the data-set over a long time period, partly for the reasons outlined above, but especially given the property market recession that occurred immediately after the period covered by the primary analysis. The introduction of Transitional Relief which is designed to smooth out differences between occupiers under the Uniform Business Rate was another factor in the decision to make the secondary analysis subsidiary to the main analytical approach.

In this thesis it is proposed to use rateable value as a uniform proxy for rental value. Whereas data from several different portfolio valuers might be subject

to errors and differences in method and opinion, the estimated rental values in the rating list are all arrived at in the same consistent manner, and they are all determined at the same date. Appendix 2 contains a discussion of the differences between *market rental value* and *estimated rental value* and examines the hypothetical tenancy that is used for the purposes of the chosen rental value proxy.

The Post-test data will be based on 1990 Rateable Values acting as a proxy for rental value at April 1988 and the Pre-test data will be based on 1973 Rateable Values, which will be treated as a proxy for rental value in April 1973. Details of this approach and its validity are discussed in Chapter 7.

The secondary analysis of rental growth in the period 1988–1998 also uses rateable value as a proxy for rental value but is not based on fully matched pairs and, for the reasons explained earlier, it used a different data-set to the primary analysis. The secondary analysis is explained in 8.8.

## 6.8 CONCLUSIONS

In this chapter the research problem has been defined and the research design has been explained. The research design uses matched pairs of properties to try to identify the extent of any tax capitalisation. Taking cross-sectional data for matched pairs on either side of the local authority boundary, the analysis investigates whether total occupation costs between the high and low rated areas are equalised.

Unlike most other UK studies of tax incidence, the value of tax benefits has been explored and, in the context of the London boroughs covered by this study, the evidence suggests that they can be safely ignored. It has been concluded that the tax benefits for businesses are unlikely to vary between local jurisdictions.

Finally, the data required have been identified and the use of rateable value as a proxy for rental value has been introduced. In Chapter 7 the data requirements are examined in more detail and the proposed data are checked by several methods to make sure that they are valid. An explanation of the pair matching process and the variables that are taken into account in making matches is also set out and the data collection process is discussed.

# CHAPTER 7

# DATA: VALIDATION, MATCHING AND COLLECTION

## 7.1 INTRODUCTION

Chapter 6 defined the research question and examined the data requirements. This chapter takes a more detailed look at the data collection and, through a series of control exercises, it seeks to resolve and address any issues relating to the data and the appropriateness of the data for the purposes of this research.

## 7.2 VALIDATING THE DATA ASSUMPTIONS

Information relating to a property may be seen as falling into two categories: objective data, which is known to a high degree of certainty, and subjective data, of which there is generally no precise knowledge, only estimates.

### 7.2.1 RATE BURDEN AND RENTAL VALUE – THE PRINCIPAL VARIABLES

For each property it is essential to know two principal variables:

rate burden per $m^2$;
rental value per $m^2$.

Rate burden is objective data that can be readily established. The total rate liability for any particular property is a matter of public information that can be identified and calculated precisely. If the area of the property is known, the liability per $m^2$ can be calculated with ease.

Unlike rate burden, the rental value of a property at a given point in time is unknown and is represented by an *estimated rental value* unless a property has just been let in the open market and the *market rental value* is known.

Rateable values in the 1990 Rating List are a particular type of estimated rental value, corresponding to the rental value of a property on 1st April 1988. The rateable value is estimated on the assumption of a hypothetical rating tenancy. The differences between estimated rental value and market

rental value, together with the terms of the hypothetical tenancy are discussed in Appendix 2.

The essential question is whether the proxy represents a good proxy for rental value and this basic assumption needs to be considered further. There are a number of potential advantages in adopting 1990 rateable values as a surrogate for rental values:

> First and foremost is the availability of the information. Rateable value observations are available for every property, regardless of whether it is vacant, let or owner occupied. Information on market rental values is commercially sensitive and may not be disclosed for research purposes.
>
> The statutory assumptions of a hypothetical tenancy and the rules for valuation hold true for all properties in the rating list, unlike other estimated rental values, which are established by reference to widely different lease terms. The same problem applies if market rental value is used. Either of these must be adjusted to reflect differences in the agreed lease terms (see A2.3 for a discussion of this topic).
>
> All valuations are at one date. The chance of getting sufficient evidence of market rental values at one date is slim. Sibley (1989) was obliged to take information on lettings over a three-year period, but in each year he used different properties, based on lettings that had taken place (at different dates) in that year (see 4.6.4).

So much for the advantages of using rateable value as a proxy for rental value. What about the disadvantages? There are several difficulties and possible problems that arise from the use of rateable value as a surrogate for rental value and these must be carefully addressed before use in this way can be validated:

> If rental levels had already begun to adjust to take account of the expected changes in rate burden when Uniform Business Rates were introduced in 1990, this would complicate the analysis. The result from the survey of occupiers (see 6.3) suggests a low knowledge of the

new system in 1989, just before it was introduced, so it is unlikely that any significant adjustment had taken place by April 1988, when the detail of the legislation was unknown. The antecedent valuation date (see A2.5) was introduced for reasons of administrative convenience but, in this study, it reduces the likelihood that occupiers in 1988 adjusted their rental bids to take account of the new rating system. Even if general expectations were taken into account, the time lag before they are transmitted to rental values further reduces the consequences of this problem.

The nature of the rateable value as a proxy for rental value makes these observations secondary data, dependent on the accuracy of the District Valuer (see A1.3.1 for a description of the functions of the District Valuer, the Chief Valuer and the Inland Revenue Valuation Office). Only market rental value would represent primary data: and any form of estimated rental value would make this observation secondary data, dependent on the accuracy of the valuer(s) responsible for producing the estimate(s).

Special care is needed in the use of secondary data and validity tests have been carried out to establish whether or not rateable values are a good proxy for rental values. As part of this testing and *before* the new rating lists were published, a series of controls was established to verify the correctness of the District Valuer's judgements. Four separate principles were adopted.

### 7.2.2 CHECKING THE UNDERLYING ACCURACY OF RATEABLE VALUES

The essential first step was to establish whether or not rateable values were in fact a good proxy for rental values.

This was achieved by making a check of rateable values published in the 1990 Rating List against a control group of properties whose rents were set in March and April 1988. Table 7.1 shows the properties that were used in this control group. This comparison was made as a way of confirming the basic validity of using rateable values as a surrogate for rental values.

**Table 7.1: Rental Proxy Compared to Market Rental Values in April 1988**

| Type | Location | Rating List | Market Value | Difference |
|---|---|---|---|---|
| Industrial | London N18 | £12,100 | £11,000 | -10.0% |
| Industrial | London N18 | £13,000 | £13,500 | +3.7% |
| Industrial | London N11 | £7,250 | £7,000 | -3.6% |
| Shop | London N13 | £23,000 | £21,000 | -9.5% |
| Shop | London N13 | £12,500 | £13,200 | -5.3% |
| Shop | London N13 | £3,700 | £3,400 | -8.8% |
| Shop | London N13 | £18,000 | £19,000 | -5.3% |
| Office | London N13 | £6,400 | £6,700 | +4.5% |
| Office | London N22 | £16,600 | £17,500 | +5.1% |
| | | **Average Difference:** | | **0.89%** |

The control properties shown in Table 7.1 were all drawn from the London Boroughs of Enfield and Haringey, and were selected in November 1989, before the 1990 Rating List was published. The selection criteria were based simply on the availability of letting evidence in April 1988.

Given the small differences and very small mean difference between market values and the rateable values, this initial comparison supports the idea of using rateable values as a proxy for rental value.

One concern with the information in Table 7.1 is that the market values shown might also have been used by the District Valuer in setting the 1990 rateable values. In fact this does not undermine the use of rateable value as a rental proxy, but it would weaken Table 7.1 as a 'proof of concept'. If the rateable values in the table are based on the letting evidence, it must be assumed that this evidence was available to the District Valuer through the completion of a Rent Return Form (see Appendix 1) which was frequently not the case.

Other reports suggest that, overall, the 1990 Rating List was generally considered accurate (see for example Evans and Cheeseright 1990) and this supports the selection of rateable value as a rental proxy.

### 7.2.3 MONITORING THE GENERAL LEVEL OF VALUES IN THE RATING LIST

A study of the level of appeals made against the new rateable values provided another insight into the validity of the rental surrogate. In this case, the comparison was again restricted to Enfield and Haringey.

Table 7.2 is based on an analysis of the rating instructions received by one firm of chartered surveyors between 1st January and 30th September 1990.

**Table 7.2: Rating Instructions against Appeals Recommended**

| Month | Shops | | Offices | | Industrial | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Instruct | Appeal | Instruct | Appeal | Instruct | Appeal | Instruct | Appeal |
| Jan | 8 | 5 | 3 | 1 | 16 | 7 | 27 | 13 |
| Feb | 21 | 12 | 16 | 5 | 26 | 2 | 63 | 19 |
| Mar | 14 | 4 | 8 | 1 | 26 | 3 | 48 | 8 |
| Apr | 12 | 6 | 5 | 2 | 19 | 4 | 36 | 12 |
| May | 15 | 10 | 2 | - | 14 | 5 | 31 | 15 |
| Jun | 11 | 5 | 4 | - | 21 | 6 | 36 | 11 |
| Jul | 9 | 6 | 2 | 2 | 17 | 4 | 28 | 12 |
| Aug | 7 | 2 | - | - | 15 | 2 | 22 | 4 |
| Sep | 23 | 17 | 6 | 1 | 29 | 7 | 58 | 25 |
| Totals | 120 | 67 | 46 | 12 | 183 | 38 | 349 | 117 |
| Appeal % | | 56% | | 26% | | 22% | | 34% |

Out of 349 instructions received to deal with rating appeals, there was a recommendation that an appeal be lodged for 34%. This decision was based on a comparison between the estimated rental value of the property in April 1988 and the entry in the 1990 Rating List.

These data appear to confirm the information provided by the local District Valuers' offices. In discussion with the Chief Valuer's office, the predicted rate of appeals against the new assessments was established. On a national basis this was expected to be 50% and, in the South-East, it was generally expected to be 60% (Morgan 1990).

The actual rating appeals in Enfield and Haringey were lower than predicted by the Chief Valuer's office. From local District Valuers the following appeal levels were identified:

| | |
|---|---|
| London Borough of Enfield | 30% |
| London Borough of Haringey | 36% |

This suggests that occupiers were more satisfied with their assessments than was expected. The implications of the lower than expected rate of appeals is discussed in more detail below.

The 34% overall appeals rate shown in Table 7.2 obscures some more interesting information when the appeals by property type are considered. Both offices and industrial properties have an appeal rate of less than 26%, whilst over 55% of the shops were recommended for appeal. It can be concluded that errors in rating assessments are probably to be found in all categories, but predominantly for shops. This data validity check could indicate that use of rateable value as a proxy for 1988 rental value may be less satisfactory for shops than for industrial and office property. It also tends to confirm the analysis made in Chapter 2 that shops will prove to be the more difficult category to investigate successfully and this was the experience of Crosby and Keogh (1990) in their examination of rate burden on retail property in Nottingham (see 4.6.5).

It should be kept in mind that the appeals data presented here were not for the Barnet/Brent Local Authority areas, which are being used for shop property, and they may have had a different appeals experience. No data were available to carry out a similar exercise for the other areas under study.

The deadline for making appeals was six months from the date of the new rating list. At the time the list was published, the business community, as well as professional advisers, believed that the statutory deadline would be strictly enforced (Cobb 1990). The expectation of a limited time to appeal explains both the high number of overall instructions received, as well as the increase at the end of the period, caused by a last minute rush. This expectation

makes these figures fairly complete – although it turned out afterwards that it was possible to make an appeal after the deadline had expired.

The appeal rate shown is considered to be low, but does not prove the correctness of the rating list, which could have a downward bias, resulting from under-valuation and a consequently low number of appeals by ratepayers. On the other hand, the low rate of appeals could be because the tax burden itself was lower than expected (especially when the transitional arrangements were taken into account). It could equally be a result of inertia on the part of business occupiers.

### 7.2.4 SELECTION OF LOCAL AUTHORITIES WITH SEPARATE VALUATION OFFICES

Even though the first two checks suggest that the use of rateable value as a rental value proxy seems to be acceptable, there was a potential additional problem present, namely the risk of *spatial interdependence*, where values in one local authority area have a biasing effect on values in the other. Primary rental evidence would undoubtedly suffer from this problem, which is described in statistical terms as *auto-correlation.* Spatial auto-correlation is a particular problem in geographical research (see for example Haining 1990; or Wiltshaw 1996).

If the District Valuers, when making their estimates of rental value for the rating list, consistently utilised rental evidence from the adjacent area, this would produce a problem of spatial dependence in the data. If the same figures per square metre were applied across borough boundaries, for example, this would have undermined the integrity of the data and its use as a proxy for rental values would not be acceptable.

For each local authority area that was chosen, the corresponding District Valuer's office was separate from the District Valuer's office in the adjoining area (at the time that the 1990 Rating List was prepared). This was a requirement in selecting the local authorities that formed the subject of the empirical case studies.

Discussion with the Chief Valuer's Office (Morgan 1989) confirmed that, if differences existed in values across local authority boundaries, these should be properly reflected in the rating list. Any co-ordination between local offices was limited to the maintenance of common valuation approaches, to ensure a uniform method of assessment, with no attempt to even out local differences in the level of values. This co-ordination between local offices took place mainly through the Chief Valuer's Office, typically through the use of internal memos and written procedures.

It is a paradox that the proxy rental value, which is secondary data, may suffer less from spatial interdependence when compared to the primary data. This is a quirk of the administrative organisation of the Valuation Office.

It should be noted that the separation of local Valuation Offices does not eliminate the problem of spatial auto-correlation within the underlying comparable evidence used by the District Valuer.

### 7.2.5 VERIFICATION THAT THE VALUATION METHODS ADOPTED WERE ACCEPTABLE

A perennial debate in the valuation profession concerns the valuation methods to be used for the 'next' rating revaluation. A number of alternative approaches have been proposed, including:

the use of statistical approaches to the revaluation (Fraser and Blackwell 1988; RICS 1998);

the use of computers and even expert systems to calculate the values (Scott 1988; McCluskey and Adair 1997);

the use of value maps and the application of rent contours to the task (Howes 1980; Hillier Parker 1987);

the application of index figures to the entries in the previous valuation list in order to arrive at the figures for the new rating list (Morgan 1990).

This topic was a fertile area of speculation in the years between the 1973 Revaluation and the eventual announcement of the 1990 Revaluation. The central office of the Inland Revenue had a research unit dedicated to the evaluation of the alternative approaches (Morgan 1989). For the proposed research design to be valid, it was important that the novel valuation approaches listed above were not employed by the Valuation Office in the 1990 Revaluation.

One of the secondary findings of Crosby and Keogh (1990 at p. 25) was that rating valuers might have adopted out-of-date techniques, appropriate to the preparation of the 1973 Valuation List, when preparing the 1990 Revaluation (at least for retail property).

To verify that traditional yet up-to-date methods were used by the Valuation Office, an interview was carried out with a representative of the Chief Valuer's office in London (Morgan 1989; 1990). This gave the following information:

> The valuation method adopted for the valuation of the property types under consideration was the traditional comparative valuation method.
>
> Advice and guidance on the methods of valuation to be employed was provided to all local offices by the Chief Valuer's Office.
>
> The central guidance was not prescriptive: District Valuers and their staff were free to use whatever techniques they deemed appropriate in arriving at their 1990 Rating List entries.
>
> No local Valuation Office was employing hedonic or other non-traditional methods of valuation for the 1990 Rating List.
>
> Each Valuation Office had a list of rental values per $m^2$ for properties of different age and type and location. These valuation rates were derived from an analysis of transactions in the local authority area of the District Valuation Office concerned. The appropriate rate was then applied to each property to be valued. Transaction evidence is available to the local Valuation Office, who have notice of all

transactions that take place in the UK and can demand information from occupiers using a 'rent return form' (see A1.3.1).

The local Valuation Offices were recommended to have control properties in their district that would be used to verify the correctness of the approach taken.

Monitoring of the figures submitted for inclusion in the rating list was carried out by the Chief Valuer's Office.

Claringbull (1989) confirmed that the comparative method of valuation was adopted when the previous valuation list was prepared in 1973. Apart from the essential role in calculating the rate burden in 1988, these data are also being used as a proxy for rental value in 1973, to facilitate the Pre-test/Post-test approach to data analysis.

It was stressed by Morgan (1989) that the idea of using rateable value as a surrogate for rental value could not be applied to all types of property. Some properties are not valued using the comparative method of valuation. Of the three property types considered in this thesis, caution was urged in the selection of factories and other industrial buildings where plant or machinery could have been assessed (within the rateable value) for rating purposes.

After carrying out these checks, it was judged that the use of rateable values as a surrogate for rental values was valid for all three types of property under consideration. It was therefore concluded that, for the purpose of the empirical work in this thesis, the rateable value in the 1990 Rating List is a valid proxy for rental value in April 1988.

It will also be assumed that the rateable value in the 1973 Valuation List was a valid proxy for rental value in April 1973, but this is asserted with less confidence because, apart from checking that the comparative method of valuation was used in the assessment, no validity tests have been carried out.

## 7.3 CHIEF OBSERVATIONS

To obtain the two principal variables of rental value and rate burden in 1988, four chief observations are required for each property.

a. 1990 Rateable Value (representing rental value in April 1988);
b. 1973 Rateable Value;
c. rate poundage for 1987/88 financial year;
d. the size of the property in $m^2$.

This information gives an observation for overall rental value (a.) and will allow the overall rate burden of any chosen property to be calculated (b. x c.).

The implicit assumption so far has been that the subject properties are identical and that differing rate burden is the only factor influencing the tenants' choice of property (and thus the rental value). In reality, property is a composite heterogeneous good and there are many factors in addition to the rate burden that will affect the rental value of the properties in the sample.

The most obvious factor is size (d. above). Meaningful analysis requires both rate burden and rental value to be expressed in consistent unit terms and for this to be possible the size of the property needs to be known or accurately estimated. The size of the property is an essential observation, the addition of which allows the two principal variables to be expressed in terms of pounds per square metre ($£m^2$).

Other factors are considered in 7.5, where the process of matching pairs is discussed in detail.

## 7.4 THE PROBLEM OF SIZE

Even the closest substitute properties (i.e. adjoining units on the same estate) will often vary in size and the overall size of a building will influence the rent per square metre.

There is a well-developed literature supporting the idea that land prices are non-linear (see for example Colwell and Munneke 1997; Lin and Evans

2000) and larger buildings will tend to enjoy a rent discount per $m^2$ over smaller buildings. This needs be reflected in the analysis (and was tested for in the pilot study in 8.3). The rental variable is expressed in units ($m^2$) and the matching criteria take account of overall size, by matching pairs into size bands, to take account of any quantity discount that may be present (see 7.5).

Unlike rental value, the size of a property does not change merely with the passage of time. Size is fixed unless there is a deliberate decision to extend or redevelop a building. Furthermore, at any point in time, size is capable of objective quantification. However, size data are not publicly available and, if two valuers measure the same building, they may arrive at different sizes, despite property size being capable of objective measurement. The problem arises through differing assumptions made about the usable area and also the existence of different definitions of size, e.g. gross external area, gross internal area, etc. To help overcome these problems a Code of Measuring Practice is published for use by valuers when measuring buildings (RICS 1993; RICS 2001).

There are several possible sources of size data for business property. At first the choice appeared to be limited to measuring the property on site or scaling the building from large scale Ordnance Survey (OS) maps (for an explanation and example of this method see Herbert 1961). Other sources of size data include information provided by valuers from their files and information from the local authority planning and property departments. The size required is the size of the rateable hereditament itself (see A2.4) and one source that must have fairly accurate and consistent size information on all properties is the Valuation Office itself, but they were approached and would not assist with provision of data, except in isolated instances.

The use of different methods of obtaining the size observation increases the possibility of errors in the recorded size of a property. Just as the accuracy and validity of using rateable values as a proxy for rental value was checked, the use of size estimates from different sources was also tested.

**Table 7.3: PROPERTY SIZE COMPARISONS** Sizes in $m^2$

Percentage difference from Measured Size

| Type | Address | Measured Size | Agent's Size | | Planning Size | | Scaled Size | |
|---|---|---|---|---|---|---|---|---|
| Industrial | London N11 | 228 | – | – | – | – | 239 | +5% |
| Industrial | London N17 | 365 | 380 | +4% | 385 | +6% | n/a[2] | – |
| Industrial | London N18 | 351 | 358 | +2% | 362 | +3% | 352 | 0% |
| Industrial | London N18 | 239 | 257 | +8% | 281 | +18% | n/a[1] | – |
| Industrial | London N18 | 2,499 | – | – | 2271 | -9% | n/a[2] | – |
| Retail | London N12 | 116 | – | – | – | – | 124 | +7% |
| Retail | London N13 | 87 | 93 | +7% | 86 | -1% | 86 | -1% |
| Office | London N9 | 298 | 310 | +4% | 292 | -2% | 311 | +4% |
| Office | London N13 | 203 | 213 | +5% | – | – | 207 | +2% |
| Office | London WC1 | 3,232 | 3,250 | +1% | – | – | n/a[2] | – |
| **Average Differences** | | | | **4%** | | **2%** | | **3%** |

All sizes are overall sizes. Percentages are given to nearest whole percentage point.
Note 1. No OS extract available. Note 2. Scaling not possible

Table 7.3 illustrates the measurement errors that can arise. The comparisons are on a control group of ten properties on which detailed measurements of size have actually been taken. These properties have been selected because of the availability of several figures for size: not because the figures illustrate a particular point. The percentage figures indicate the percentage difference from the measured size, which should be taken as the most accurate observation.

It did not prove possible to obtain a scaled size for four of the properties in the table. Where it is stated that scaling is not possible (Note 2) this is because the accommodation is arranged on more than one floor, a fact that can most easily be established by a field survey and which is known for these buildings because they have been measured. Where a property has not been inspected, scaling alone is an unacceptable method.

This demonstrates the extent of variation between the various sources that could be used for the size observation. It shows how the use of several different sources could lead to errors in the data. It could be argued that it is

better to stick to one method – such as scaling OS plans – and accept that all observations will have the same chance of random error, but this approach is not possible for all properties. Whilst the method may give acceptable results for single-storey properties, such as retail or industrial premises (subject to verification during the field survey), it is less easy to apply to offices or multi-storey buildings. Even for retail property, the need to take account of the more valuable retail frontage and to apply a discount to non-selling space makes scaling less acceptable. In addition, there is the important distinction between the property and the rating unit, which needs to be taken into account (see A2.4).

Against this background, the likelihood that the size data would have to be drawn from various sources was accepted, along with the fact that some observations would be more accurate than others. The size observation is considered the least reliable of the chief observations used to calculate the two principal variables, but it seems reasonable to assume that systematic errors would not be present within the size data if they were collected in this way.

These checking procedures were carried out to determine the validity of alternative approaches to the collection of size data. They do not provide any check on the accuracy of the actual sample data collected and it was considered worthwhile to devise a test of the main hypothesis that is independent of the size observation. A longitudinal test is used for the secondary analysis of rental growth after 1990 and this is constructed to be independent of the property size (see 8.8). In Appendix 9 this test is applied to the data used for the primary analysis as a cross-check on the size observation.

## 7.5 MATCHING OF PAIRS

As explained in Chapter 6, it was decided to use a matched pairs approach to the selection of properties for the analysis. This involves carefully selecting properties that are matched according to the hypothesis set out in 6.2. The matching approach minimises the number and variety of control variables needed in the analysis itself, but it must be used with care.

The selection of pairs in matched pairs design commonly appears to adopt non-rigorous sampling methods (see for example O'Farrell and Hitchens 1989; O'Farrell et al. 1992; Westhead 1995). When choosing which properties to include in the pairings (and therefore the data-set) the selection was based on judgement within a rigorous selection framework.

A more rigorous selection framework was adopted when matching pairs for use in the primary analysis than was used for matching pairs for use in the secondary analysis. Each of these analyses used a different data-set and the reasons for this are discussed and explained in 6.7. The matching approach is set out at 7.5.1 for the primary analysis data and at 7.5.2 for the secondary analysis data. The data collection process is explained in 7.6.

It is important to note that, to guard against any bias, apart from a categorisation of size, the other variables that were used in the analysis itself were explicitly ignored when matching the pairs together. No calculations were carried out until after the pairs were chosen and no regard was given to the rateable value of a property in the matching process.

### 7.5.1 PRIMARY ANALYSIS MATCHING CRITERIA

For each data-set used in the primary analysis, the initial goal was to identify two types of pairings: fully-matched and partly-matched. The aim was to carry out an analysis for the set of fully-matched pairs and further analyses for the partly-matched pairs that were expected to form a larger data-set. However, it did not prove possible to identify a meaningful set of partly-matched properties for either retail or office property (see Tables 7.4, 7.5 and 7.6 for a description of the data-sets used in the main analysis).

Only pairs of properties that were closely matched, one in each local authority area, are included in the primary data analysis.

The pairs of properties have been chosen to match on the basis of the following five major criteria:

| | |
|---|---|
| Size | pairs must be in the same size category; |
| Location | pairs must be in close proximity to each other; |
| Physical | pairs must match in terms of age and physical characteristics; |
| User | pairs must match in terms of building and planning use; |
| Technical | pairs must meet certain rating and other criteria. |

These major matching criteria are divided into detailed characteristics. These are explained in the following list which outlines the control variables and other property characteristics that were used in the pairing exercise.

Location

- Measures to rank properties by quality of location
- Access to the road network and other transport links

Physical

- A measure of the quality and construction of the building
- A measure of the physical arrangement of the property
- A description of the construction
- The approximate date of construction
- The apparent state of repair of the property
- Other relevant physical characteristics of the property

User

- The planning use of the property
- The physical use of the property

Technical

- Service charge categorisation for the property
- Information on alterations to the 1973 Valuation List since 1988
- Details of any material alterations to the property since 1988
- Status of the property as a composite hereditament
- Status as a cross-boundary property

The above list was initially developed for industrial property that was used in a trial data collection exercise. The technical heading includes aspects of the rating system and the hypothetical tenancy that are discussed in A2.4 and A2.5.

When collecting the data, a number of observations were recorded for each property. In the case of property information, the control variables are typically qualitative data, which are more difficult to deal with than quantitative data. Qualitative observations were classified using a five point scale (e.g. poor, mediocre, average, good, excellent). Decision rules were implemented for other matching criteria that were not categorical (see Figures 7.1, 7.2 and Apppendix 10).

Figure 7.1a shows the full list of matching criteria that were used when selecting pairs for industrial property. The industrial property that was finally selected is predominantly light industrial and warehouse property. Factories were generally ineligible because of the need to exclude properties where there was an element of plant and machinery in the rating assessment (see 7.2.5).

The chief locational matching criteria for industrial property is distance to the nearest major transport route, in this case the A406 North Circular Road or the A10 Great Cambridge Road.

The list of matching criteria was revised and amended for the matching of office and retail property.

The locational quality of office property was based on travel time to the nearest underground station(s). Bus routes were not classified, not because they are unimportant, but because access to bus routes was evaluated and appeared to be evenly spread throughout the area. Figure 7.1b shows the full list of matching criteria that were used when selecting pairs for office property.

For office property, the key physical characteristics included the number of floors, the type of services such as air conditioning, lifts and modern facilities (e.g. random access raised floors).

Office occupiers and a few industrial occupiers are likely to be charged a service charge in addition to the rent they pay to the landlord and this is a factor that does not affect retail property (of the class used in this study). Service charge should be considered as one of the total occupation costs

that will be taken into account in the location decision but, unlike rent and rates, service charge will not differ according to the location of a property. It will instead differ according to the level of services provided. The service charge is normally based on the costs of supplying and maintaining the services to a building.

The RICS Building Cost Information Service maintains detailed information on construction and running costs throughout the UK and they confirm that, for properties in the same region having a similar age and standard of services, it is reasonable to expect the service charge per $m^2$ to be similar (Pegg 1999). By matching properties by the overall service package, service charge is effectively eliminated from the occupation cost equation and does not need to be taken into account in the data analysis.

For retail property, distinctions were made between selling space and non-selling space and the physical characteristics were expanded to include the frontage, pavement width and shop front design.

The locational quality characteristic (prime pitch, secondary pitch, etc.) was based on a survey of pedestrian flow in the local shopping area, with a higher flow being accorded a better ranking. The final classification of retail pitch was settled after discussion with a local firm of chartered surveyors who deal with commercial property in this district.

Figure 7.2a shows the full list of matching criteria that were used when selecting pairs for retail property. The occupiers of properties were classified into groups according to the activity of occupier. This classification and the constituent activities are shown in Figure 7.2b.

Appendix 10 gives more detailed information on the way the detailed criteria were categorised, setting out the decision rules used to match properties into pairs.

Retail properties were the most likely to include a residential component in their rating assessment and these 'composite hereditaments' (see A2.4) were excluded from the matching process.

# INDUSTRIAL AND OFFICE MATCHING CRITERIA

**SIZE**
< 100 $m^2$
101–200 $m^2$
201–500 $m^2$
501–1000 $m^2$
> 1000 $m^2$

**LOCATION**
Estate location
Non-estate location

Property or estate fronts on to A road
Property or estate fronts on to B road
Property or estate fronts on to unclassified road

Distance from junction with A10
Distance from junction with A406
Distance to rail or underground station

Distance to local shops
(for convenience of employees)

**PHYSICAL**
Age 1975–present
Age 1960–75
Age 1960–75 refurbished
Age 1945–60
Age 1945–60 refurbished
Pre-1945
Pre-1945 refurbished

PHYSICAL CONT...

Modern framed structure
Traditional industrial structure
Load bearing brick structure

Single span
Multiple span

Apparent state of repair

General modernity

Eaves height

Loading bay

Single-storey accommodation
Multi-level accommodation

Allocated parking on site
Allocated parking off site
Unallocated parking on site
On street parking without restrictions
On street parking with restrictions
Distance to nearest public car park

**USER**
Actual user of the building

<5% Office space
6%–15% Office space
16%–30% Office space
>30% Office Space

USER CONT...

Planning use is B1
Planning use is B2
Planning use is B8
Planning use is sui generis

Property user is industrial
Property user is light industrial
Property user is vehicle repair/workshop
Property user is warehousing and distribution
Property user is high tech
Property user is office

**TECHNICAL**
Subject to estate charges

Alterations to 1973 List since April 1988
Material alterations since April 1988
Assessed to Net Annual Value in 1973 List
Cross-boundary property
Composite hereditament

**Figure 7.1a: Industrial Matching Criteria**
*See Appendix 10 for additional breakdown*

**SIZE**
< 50 $m^2$
51–200 $m^2$
201–1000 $m^2$
1001–2000 $m^2$
> 2000 $m^2$

**LOCATION**
Distance from nearest underground station
Distance from Holborn underground station
Distance from closest northbound bus stop
Distance from closest southbound bus stop
Distance from closest eastbound bus stop
Distance from closest westbound bus stop
Distance from Aldwych

**PHYSICAL**
Age 1975–present
Age 1960–75
Age 1960–75 refurbished
Age 1945–60
Age 1945–60 refurbished
Pre-1945
Pre-1945 refurbished

Accommodation spans multiple floors
Spans multiple floors (2nd foor and up)
Spans multiple floors (1st floor and below)
First floor
Ground floor
Basement

PHYSICAL CONT...

Clear space (not subdivided)
Subdivided internally (permanent)

Apparent state of repair

General modernity

Prestige

Floor to ceiling height

Lift
Air conditioning
Suspended ceiling
Double glazing
Random access raised floor

Private entrance
Shared entrance

Simple framed structure
Cantilever framed structure
Load bearing brick structure

Allocated parking on site
Allocated parking off site
Unallocated parking on site
On street parking without restrictions
On street parking with restrictions
Distance to nearest public car park

**USER**
Property user is office
Property user is high tech
Planning use is B1
Planning use is other office
Planning use is sui generis
Planning use is unknown

**TECHNICAL**
Subject to service charges
  Including lift
  Including lift and reception
  Including lift, reception and security

Alterations to 1973 List since April 1988
Material alterations since April 1988
Assessed to Net Annual Value in 1973 List
Cross-boundary property
Composite hereditament

**Figure 7.1b: Office Matching Criteria**
*See Appendix 10 for additional breakdown*

# RETAIL MATCHING CRITERIA AND ACTIVITY CLASSIFICATION

**SIZE – OVERALL**
< 50 $m^2$
51–100 $m^2$
101–200 $m^2$
> 200 $m^2$

**SIZE – IN TERMS OF ZONE A**
< 20 $m^2$
21–50 $m^2$
51–100 $m^2$
> 100 $m^2$

**LOCATION**
Prime pitch
Secondary pitch
Off pitch

Distance (in metres) from pedestrian crossing
Distance from closest bus stop
Distance from unrestricted on street parking
Distance from public car park
Distance from Cricklewood rail station
Distance from Willesden Green underground

**PHYSICAL**
Age 1970–present
Age 1945–70
Age 1945–70 refurbished
Pre-1945
Pre-1945 refurbished

PHYSICAL CONT...

Retail space on ground floor only
Retail space on ground and first floors
Retail space on ground and lower ground floors
Retail space on three or more floors

Apparent state of repair

Modern shop front
Non-modern shop front

Single display window
Double display window
Triple display window
Four or more display windows

Refurbished retail display area
Currently modern overall
General modernity

Frontage (in metres)
Return frontage (in metres)

Pavement width (in metres)
Roller shutter security
Rear delivery access
Staff parking on site

Load bearing brick structure
Modern framed structure

<10% Ancillary space
11%–20% Ancillary space
>20% Ancillary space

**USER**
Actual user of the building

Convenience outlet
Comparison outlet
Service outlet
Catering outlet
Miscellaneous outlet

**TECHNICAL**
Alterations to 1973 List since April 1988
Material alterations since April 1988
Assessed to Net Annual Value in 1973 List
Cross-boundary property
Composite hereditament

**Figure 7.2a: Retail Matching Criteria**
*See Appendix 10 for additional breakdown*

**CONVENIENCE OUTLETS**
Butchers
Bakers
Confectioners
Chemists
Greengrocers
Fishmongers
Florists
Newsagents, tobacconists
Off-licences
Supermarkets, grocers

**COMPARISON OUTLETS**
Booksellers, stationery, cards, printing
Building, DIY, decorating, ironmongers
Camping and outdoor shops
China and glasswear
Department stores
Fancy goods
Footwear shops
Furniture, furnishings and carpets
General and household goods
Hi-fi, electrical goods
Ladies' and girlswear outlets
Men's and boyswear outlets
Motor accessories/cycle shops
Toy and hobby shops

**SERVICE OUTLETS**
Banks
Beauty salons
Building societies
Hairdressers
Dry cleaners
Estate agents
Shoe repairs
Travel agents

**CATERING OUTLETS**
Cafés
Fast food outlets
Restaurants
Take-aways

**Figure 7.2b: Retail Activity Classification**

### 7.5.2 SECONDARY ANALYSIS MATCHING CRITERIA

For each property type, a separate, larger, data-set was identified for use in the secondary analysis. The reasons for using a different data-set are discussed in 6.7 but it is important to explain here that the secondary analysis is designed to be a supporting supplementary analysis. For this reason, the approach to the data collection, the matching of pairs and the analysis itself (see 8.8) are less rigorously specified than for the primary analysis.

Nevertheless, the matching process applied to the data used for the secondary analysis adopted the same principles that were employed in matching the primary data-set: the use of judgement based on a rigorous selection framework. However, for the secondary data-sets, the matching criteria were significantly fewer, and not every property in the data-set was subject to a field survey, which meant that the closeness of the matching is less exact.

The secondary data-sets were matched first on the basis of building size scaled from the large scale OS maps. The actual analysis of the secondary data-sets is independent of property size (see 8.8) but size is still a key criterion in matching the pairs for inclusion in the data-set.

It was considered that scaled size could be an adequate proxy for actual size in the context of industrial and retail property (see 7.4), but without a field survey it was unlikely to be a satisfactory proxy for the rentable area of a whole office building, which is likely to be constructed on more than one floor, especially in the city centre location that is used in this study.

For retail property the frontage was also used in the matching process and for industrial property the site area was used as a secondary size control. Both of these were established by scaling from large scale OS maps.

For office property, the scaled size of the building was treated as representing a single upper floor in the building. Office properties were only included in the analysis if the rating assessment referred to a single whole upper floor. In this way, the scaled size acts as a proxy for the size of the rateable unit. The main disadvantage of this approach is that it restricts the number of properties that can be included in the office data-set for the

secondary analysis. Ground and lower ground floor accommodation was excluded because of the difficulty of approximating the rentable area from a scaled size (due to the extent of any reception, circulation and plant space).

There was one further control on size in the secondary matching exercise for all three property types: for a property to be selected in the matching process the scaled size from the circa. 1990 OS map must correspond with the scaled size from the circa. 2000 OS map.

Size alone is not an adequate basis for matching the pairs and for each of the three property types, one or two other matching criteria were adopted.

Industrial properties were matched using two additional criteria. Whether or not the unit was on an estate or non-estate location and the distance from the nearest major road, which is the same locational criterion that was used for the primary data matching (see 7.5.1 and. Appendix 10).

Retail properties were matched using a single criterion, adopting the same classification of prime pitch that was constructed for the primary matching (see 7.5.1) but with the addition of two further classifications, for units within a local parade of shops and for single shops (i.e. 'the corner shop'). This was necessary to reflect the wider area covered by the secondary data-set which is not restricted to the core high street shopping area.

Office properties were matched using two criteria. The floor within the building was matched to within one floor, so that a pairing would only be made for units that were on equivalent floors in their respective building. (i.e. a unit on the third floor of a building in Westminster would be matched with a corresponding unit on the second, third or fourth floor in Camden). The locational quality of office property was based on travel time to the nearest underground station(s) which is the same criterion that was adopted for the primary analysis (see 7.5.1 and Appendix 10).

There are weaknesses in the approach of using so few matching criteria, in particular for offices and industrial, where no attempt was made to match on the basis of age or quality (this was considered less relevant for the type of retail property adopted in this thesis). However, as explained at the beginning of this section, the secondary analysis is supplemental in its nature and these issues are not considered to be central in the context of the analysis undertaken.

## 7.6 DATA COLLECTION

Data for the main empirical work were collected for three separate property types in six London boroughs, with the most extensive data collected for industrial properties. The industrial data were collected in Enfield and Haringey. The retail data-set was collected in Barnet and Brent and data for the study of office properties were collected in Westminster and Camden. A review of these six London boroughs was presented in 5.7.

The data collection procedure for each property type involved a systematic and iterative process of unit identification, followed by a field survey for each property. In most cases, but not all, this involved an internal inspection of the building. In addition to the field survey, information on individual properties was collected from public and unpublished sources. The rental value was in all cases based on the use of the entry in the 1990 Rating List, although actual rental value observations were also recorded for many properties in each data-set (these were not used in the analysis). Unpublished sources include valuers, estate agents, local authority records and the owners and occupiers of the buildings themselves.

For each unit, the chief and secondary observations were collected and catalogued before the classification was made of any qualitative characteristics. Prior to the data collection, a series of checks was carried out to give a better understanding of the data, its limitations and the validity of the assumptions made (see 7.2). The properties were then matched into pairs using the matching criteria set out in 7.5.1.

For each property type, a separate data-set was identified for use in the secondary analysis, which tests for differential rental growth following the elimination of tax differentials in 1990. The main reason for using a different data-set was the difficulty of keeping the matching criteria intact over a 12-year period between 1988 and 2000 (see 6.7 for a discussion of the data requirements and issues). Another reason was to introduce diversity into the data that were used in the empirical work. It also helped to guard against the possibility of some systematic bias being present in the data and it allowed a larger, albeit less rigorously selected, data-set to be used for this analysis

(see 7.5.2). The secondary data-sets were used only for this secondary analysis, which covers rental growth between 1988 and 1998 (see 8.2 and 8.8). These additional data-sets had three chief variables: 1990 Rateable Value, 1995 Rateable Value and 2000 Rateable Value.

The following sections summarise the data-sets that were collected for each property type. The maps referred to below (Figures 7.3, 7.4 and 7.5) are used to exemplify the cross boundary areas where data were collected, but data were collected from a wider area than the area shown by the figures.

### 7.6.1 INDUSTRIAL DATA-SETS

Figure 7.3 illustrates one of the main districts in Enfield and Haringey where the industrial properties were located. The industrial areas selected do not include many properties of institutional investment quality and the units selected for this data-set are almost all secondary properties.

**Table 7.4: Industrial Property Data-sets**

| Data-set Name | Number of Cases | Number of Pairs | Matching Criteria | Comment |
|---|---|---|---|---|
| Data-set A – Industrial | 471 | - | - | All primary cases |
| Data-set A1 – Industrial | 70 | 35 | Full | Primary analysis |
| Data-set A2 – Industrial | 114 | 57 | Part | See Appendix 8 |
| Data-set B – Industrial | 170 | 85 | Part | Secondary analysis |

Data-sets A1 and A2 are subsets of Data-set A: the key variables for these data-sets are listed in Appendix 7. Figure 7.3 does not illustrate the complete area covered by the data collection.

A total of 471 properties was identified where information was collected on all of the four chief observations identified in 7.3. Out of this group (Data-set A in Table 7.4), it was possible to identify 35 fully matched pairs and 57 partly matched pairs to be used in the primary analysis.

Unit level analysis of size for industrial property was carried out using overall size in $m^2$.

# MAP OF ENFIELD/HARINGEY

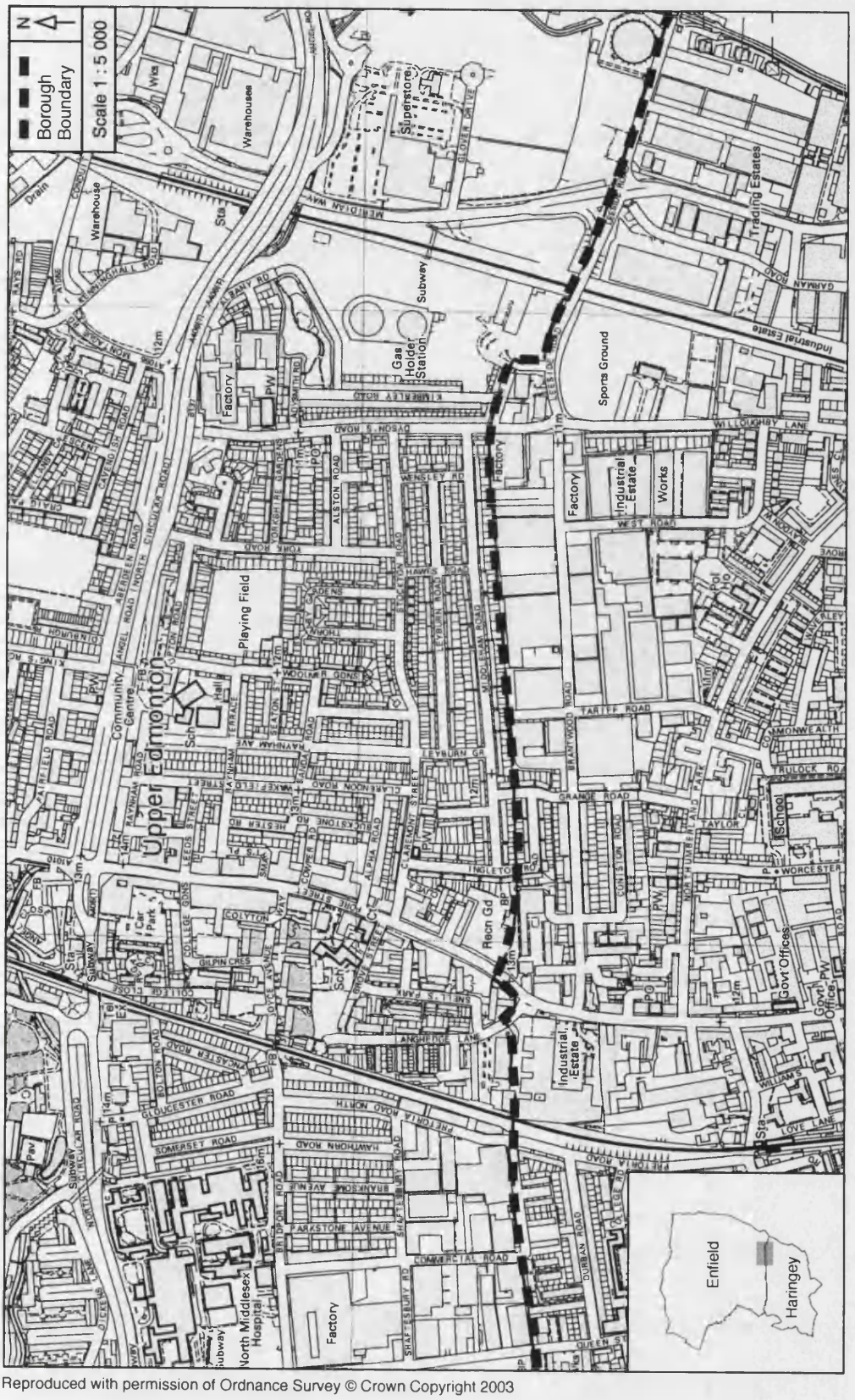



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**Figure 7.3: Map Illustrating Enfield/Haringey Industrial Property Location**

## 7.6.2 RETAIL DATA-SETS

Figure 7.4 illustrates the main area in Barnet and Brent where the retail properties used for the primary analysis were located. This is a local shopping centre, comprised of secondary property. At the time of the study the majority of units were occupied by small or local businesses and a few units were let to national multiple retailers. See Figure 6.1 for a detailed extract that shows part of the main shopping area that was used.

**Table 7.5: Retail Property Data-sets**

| Data-set Name | Number of Cases | Number of Pairs | Matching Criteria | Comment |
|---|---|---|---|---|
| Data-set C – Retail | 224 | - | - | All primary cases |
| Data-set C1 – Retail | 42 | 21 | Full | Primary analysis |
| Data-set D – Retail | 174 | 87 | Part | Secondary analysis |

Data-set C1 is a subset of Data-set C: the key variables for this data-set are listed in Appendix 7. Figure 7.4 does not illustrate the complete area covered by the data collection.

Data were collected on a total of 224 properties for each of the four chief observations identified in 7.3, from which it was possible to identify 21 closely matched pairs. It did not prove possible to identify a group of partly matched pairs for the retail data-set used in the primary analysis.

For retail property, unit level analysis of size was carried out using zones of 5m depth and the analysis was made in $m^2$ in terms of zone A (for a full explanation of retail zoning see Bassett et al. 1987 at pp. 109–121). The majority of shops using in the primary analysis were measured unless detailed size information was available from other sources.

Figure 7.4

MAP OF BARNET/BRENT

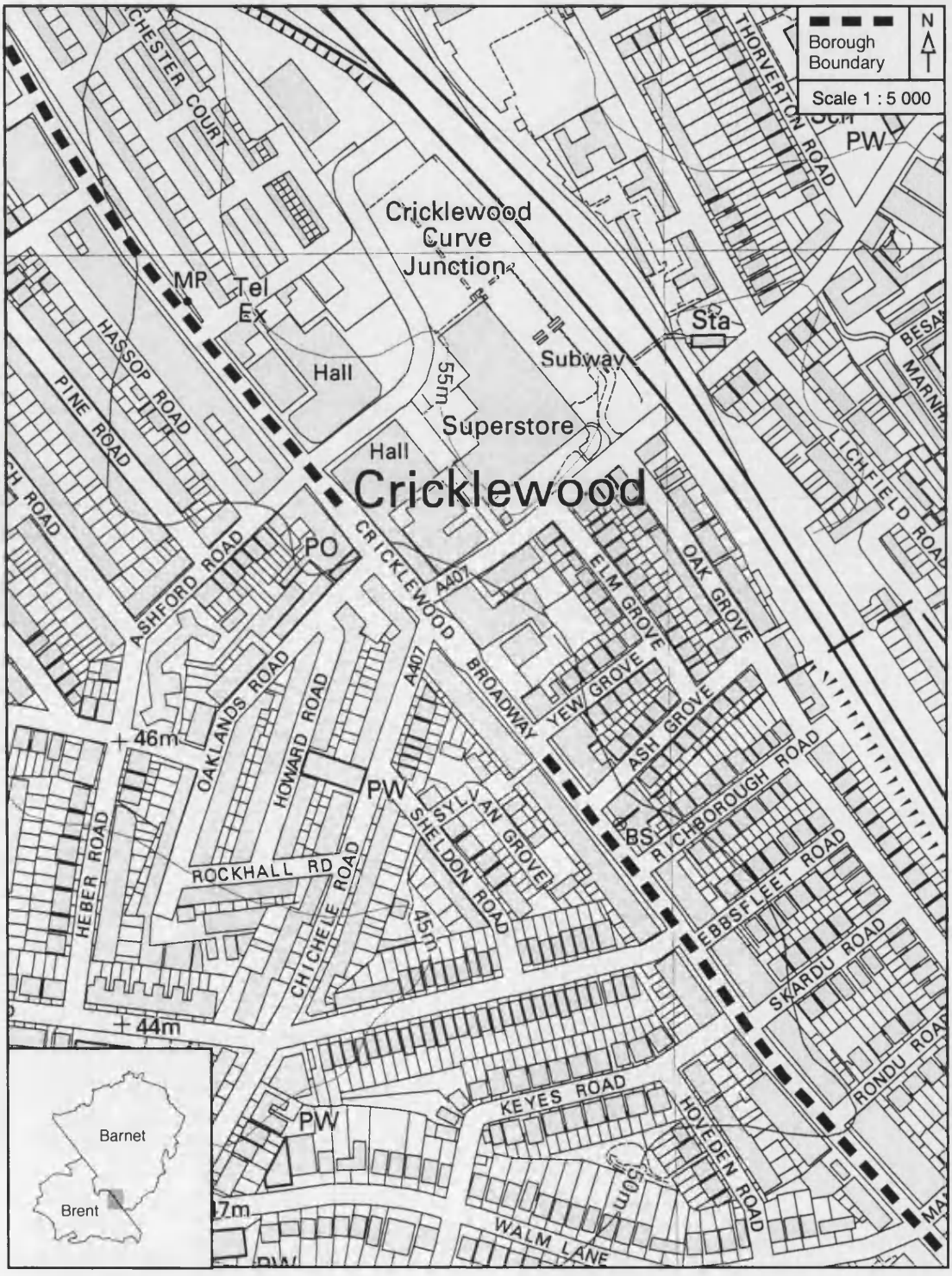




**Figure 7.4: Map Illustrating Barnet/Brent Retail Property Location**

## 7.6.3 OFFICE DATA-SETS

Figure 7.5 illustrates the district in Westminster and Camden where the office property was mainly located. Unlike the properties used for industrial and retail, the office data-set is made up of offices that are considered to be prime property of institutional investment quality. This is a function of the central London location.

**Table 7.6: Office Property Data-sets**

| Data-set Name | Number of Cases | Number of Pairs | Matching Criteria | Comment |
|---|---|---|---|---|
| Data-set E – Office | 187 | - | - | All primary cases |
| Data-set E1 – Office | 42 | 21 | Full | Primary analysis |
| Data-set F – Office | 64 | 32 | Part | Secondary analysis |

Data-set E1 is a subset of Data-set E: the key variables for this data-set are listed in Appendix 7. Figure 7.5 does not illustrate the complete area covered by the data collection.

Twenty-one closely matched pairs were identified for office property, out of a total of 187 properties for which data were collected on each of the four chief observations identified in 7.3. Partly matched pairings did not prove to be possible for the data-set used in the primary analysis, nor was it possible to collect adequate data to allow pairings of smaller or secondary offices.

Unit level analysis for office property was carried out using overall size in $m^2$. The size observation for office properties proved to be the most difficult to obtain and the sizes used are mainly letting sizes from the landlord or their agents.

Figure 7.5

## MAP OF WESTMINSTER/CAMDEN



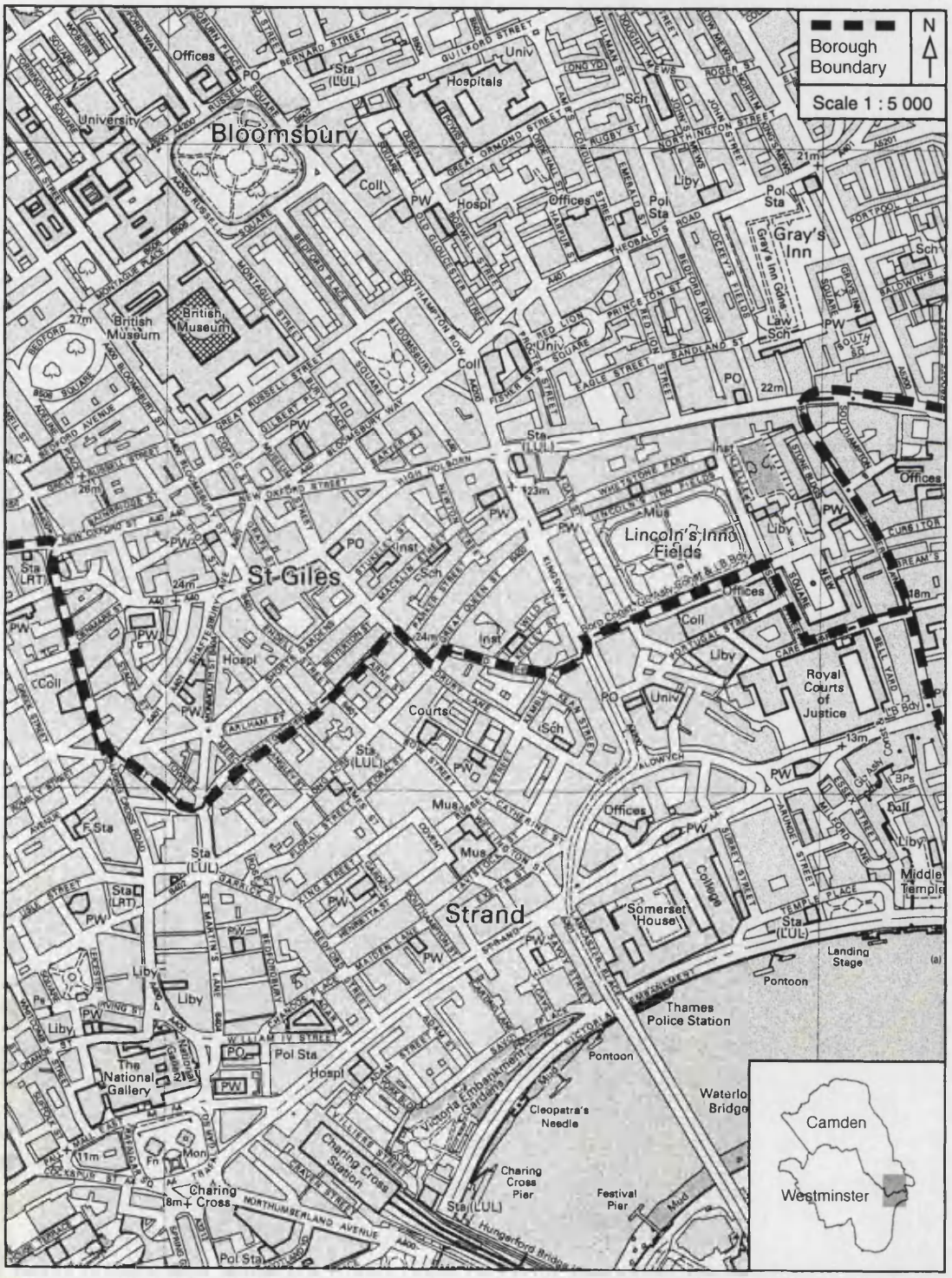


**Figure 7.5: Map Illustrating Westminster/Camden Office Property Location**

## 7.7 CONCLUSIONS

In this chapter, the data required have been identified and evaluated to make sure that they can meet the requirements of the research design set out in Chapter 6. Where possible the threats to validity have been identified and the steps taken to validate the data have been explained.

The detailed criteria for the selection of matched pairs have been explained and the different criteria for each property type have been listed. If the hypothesised results are to be successfully identified it will be in large part due to the quality and control of data collection that has afforded accurate analysis.

The data collection process was explained for each of the three property types and the data-sets to be used in the analysis were described.

Chapter 8 now explains the statistical analysis undertaken and presents the results of that analysis. It introduces a further element of control for the data, testing the rental value proxy (in 1988) against market data in a pilot study that applies the research design and proposed analysis to letting data for office property.

# CHAPTER 8

# DATA: ANALYSIS AND RESULTS

## 8.1 INTRODUCTION

The previous two chapters described the framework for the empirical research, setting out the research hypothesis and explaining the research design. The key variables that were required for the data collection were identified, assumptions about the validity of the data were tested, and the data collection process was summarised.

In this chapter the data analysis techniques are explained. The results of the analysis are then presented both for the main study and for the pilot study that was carried out using market rental values to triangulate the results obtained using the rental value proxy.

The empirical results presented here are for industrial property in the London Boroughs of Enfield and Haringey, retail property in the London Boroughs of Barnet and Brent, and office property in the City of Westminster and the London Borough of Camden. Chapter 5 explained the choice of these six London boroughs and showed how the rate burden in these boroughs diverged in the 1980s, creating the circumstances that are used in this empirical work.

## 8.2 SUMMARY OF DATA ANALYSIS PROCEDURES

The data analysis procedures used to test the research hypothesis set out in 6.2 are made up of four specific tests shown in Table 8.1. The tests carried out fall into two groups. The *primary analysis* was based on the cross-sectional data. The *secondary analysis* was designed to provide a longitudinal dimension to the study.

**Table 8.1: Data Analysis Tests**

| *Primary Analysis* | | | |
|---|---|---|---|
| **No.** | **Description** | **Context** | **Type** |
| Test 1 | Pre-Divergence Equivalence | Pre-test | t-test/descriptive stats/ comparison of total costs |
| Test 2 | Post-Divergence Impact | Post-test | t-test/descriptive stats |
| Test 3 | Equalisation of Total Costs | Post-test | t-test/descriptive stats/ comparison of total costs |
| *Secondary Analysis* | | | |
| **No.** | **Description** | **Context** | **Type** |
| Test 4 | Differential Rental Growth | Longitudinal | Internal rate of return |

The underlying design for the primary analysis is the Pre-test/Post-test design that was explained in 6.5. Standard tests of statistical significance were used, first to test the data in 1973 before the divergent rate burdens emerged (the Pre-test) and then in 1988 after the divergent rate burdens had been present for a number of years (the Post-test). The long time period was expected to allow the impacts of the differing tax rates to work through to differences in rents. There are several analyses undertaken within the primary analysis, each of which was applied to the three separate property types.

Details of the cross-sectional tests that are used for the primary analysis are set out in 8.4.

The primary analysis was supplemented by a secondary analysis that introduced a longitudinal dimension and was used as a further check on the main findings. This test involved the calculation of rental value growth over the period 1988–1998, which was made possible through the use of additional data, collected following the introduction of Uniform Business Rates in 1990. This is a single test, which was applied to each of the three separate property types.

The longitudinal test used for the secondary analysis is described in more detail in 8.8.

Individual observations (or measurements) from the two locations for each property type were matched together on the pre-specified criteria that were discussed in 7.5. The statistical analysis takes account of the matching and statistical methods suitable for paired data were employed where appropriate (the pilot study properties were not matched). The test used for each analysis is dependent on the distribution of the differences between the two locations. If the differences are normally distributed, a paired t-test can be used and this proved to be acceptable for all variables in the analysis. The t-distribution is appropriate for tests of significance when the sample size is small.

By applying the paired t-test to investigate the difference between the two samples means it is possible to ascertain whether the sample variances are sufficiently alike to justify the assumption that they are independent estimates from the same population. The significance level **p** is used to define the sensitivity of the test and in this thesis a value of:

**p** $< 0.1$ will be treated as a statistically significant result.

The smaller the **p-value**, the greater the significance, but the question of precisely what significance level is appropriate is a topic of much debate. Significance levels of 0.05 and below have customarily been viewed as being statistically significant, with anything above being rejected as not statistically significant. This level of significance, which has been inherited from the natural sciences, may be right for reproducible laboratory experiments, but it is not considered appropriate in a study of this type. Recent literature confirms a general trend away from 'interpretative rigidity in the assessment of statistical tests of hypotheses' (Chow 1996) and Sterne and Smith (2001) propose that a 90% significance level should be used instead of 95%. They go on to suggest that arbitrary thresholds that determine significance should not be used in judging results.

All tests of statistical significance, descriptive statistics and other aspects of the data analysis were carried out using SPSS software.

## 8.3 PILOT STUDY – TRIANGULATING THE RESULTS

Trial data were initially collected for industrial property in Enfield and Haringey and these were used for the data validation and triangulation that was carried out in Chapter 7 and it was also intended to use these data to test the analysis presented here. However, Ian Sibley kindly made available the data-set from his study of office property (see 4.6.4), which was published in 1989 and it was decided to use these data for the pilot study. One powerful feature of Sibley's data is that all observations are for open market lettings (representing market rental value, not estimated rental value).

The aims of the pilot study were to gain a better understanding of the analysis process, to help make decisions about the most appropriate statistical approach for the main study and, importantly, to triangulate the main results (which are based entirely on the rateable value proxy) against real data. Although the validity of the data collection process was carefully evaluated, it was still felt important to have the results tested against actual rental evidence.

An additional aim was to see if more robust results could be obtained for Sibley's office data than were presented by Sibley himself, who made no tests for statistical significance.

### 8.3.1 PILOT STUDY DATA-SET

The data were reviewed and analysed without change or adjustment. No time was spent refining the data collection or in collecting additional data attributes.

**Table 8.2: Sibley's Office Property Data-set**

| Year | Number of Cases | Number of Pairs | Matching Criteria | Comment |
|---|---|---|---|---|
| 1983 | 14 | 7 | - | Not matched |
| 1984 | 18 | 9 | - | Not matched |
| 1985 | 34 | 17 | - | Not matched |
| Total | 66 | 33 | | |

The key variables for this data-set are listed in Appendix 7. Letting dates for each property within the year of observation vary.

For each property in the data-set the following observations were available:

YEAR in which rent was agreed (1983, 1984, 1985)
SIZE of property in $m^2$
1973 RATEABLE VALUE
TAX RATE in YEAR
TAX BURDEN in $m^2$
RENT agreed on a new letting in YEAR
LOCATION (either Westminster or Camden)

The data collected by Sibley were not cross-sectional, relying on rental observations in three separate years, yet it is not a true time series because the data are collected from different subjects (in this case properties) in each year. Most longitudinal designs use panel data, which involves tracking the same subject over time and, where this is not the case, it is more properly referred to as a 'quasi-longitudinal' design (de Vaus 2001 at p. 129).

Regression analysis was used in an analysis of the whole data-set, to control for the year in which the rent was measured but this type of analysis is not used elsewhere as part of the primary or secondary analysis procedures. The results and procedures for the regression analysis are set out at 8.3.2.

The pilot study data were also analysed using each of the four tests set out in Table 8.1. This analysis took Sibley's 1985 data subset and treated it as a single data-set. The results from the analysis of the pilot data are presented later in this chapter, following the explanation of the analysis methods and their supporting statistical hypotheses. For the primary analysis, the relevant pilot study results are presented at 8.4.4; for the secondary analysis, the pilot study results are presented at 8.8.2.

## 8.3.2 REGRESSION ANALYSIS OF PILOT DATA-SET

In order to control for the year in which the rent was observed, regression analysis was used to examine the effect on this variable for the complete data-set from Table 8.2 (covering 1983, 1984 and 1985).

The difference between the locations was examined for a single outcome variable, namely the rent.

A linear model was adopted using a single empirical equation. The value for any given property 'i' is:

$$Y_i = \beta_0 + \Sigma \beta_j X_{ij} + \varepsilon_i \qquad \text{for } j=1...m,\ i=1...n,\ \text{for constants } \beta_0 ... \beta_m$$

where

$Y_i$ = outcome rent for property i
$X_{ij}$ = explanatory variable j for property i
$\varepsilon_i$ = residual for property i

One of the assumptions of linear regression is that the residuals (the differences between the predicted outcomes from the regression model and the actual outcomes) are normally distributed, which is often the case if the outcome variable is normally distributed. An examination of the relevant variables indicated that this assumption was satisfied and the variables were analysed on their original scale.

The first stage in the analysis was to see if the properties were drawn from the same population in 1973. This is Test 1 from Table 8.1, which is explained in more detail in 8.4.1 below. The results of this test are set out in Table 8.3.

**Table 8.3: Pre-Divergence Equivalence in 1973**

Sibley's Office Data-set – 66 cases

**Variable:** 1973 Rental Value per $m^2$

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Westminster | 33 | 38.11 | 15.875 | 2.764 |
| Camden | 33 | 36.47 | 10.268 | 1.787 |

| Independent Samples T-Test | t Value | Degrees of Freedom | 2-tailed P-Value |
|---|---|---|---|
| Equality of mean values | -0.497 | 64 | .621 |

The results indicate no evidence of any differences between the two locations in 1973, before the period of tax rate divergence (p=0.621). It should be remembered that this table is based on the 1973 Rateable Value acting as a proxy for rental value (and not actual market rents).

The next stage in the analysis was to compare the difference in locations in the period 1983–1985.

Regression analysis allowed the introduction of an additional control, which was added to see if there was a non-linear relationship between overall property size and rent per $m^2$. If found, this relationship might need to be addressed in the primary analysis carried out for this thesis. The analysis was made both unadjusted and adjusted for the confounding factor of size (in $m^2$). Even the 'unadjusted' relationship was actually adjusted for the year that the property was let, whilst the adjusted relationship controlled for both year and size. This analysis is based on rental values from open market lettings.

The results are summarised in Table 8.4. The figures reported are a measure of the difference in Camden relative to Westminster, together with the corresponding confidence interval (CI) at 90%.

**Table 8.4: Post-Divergence Impact – Regression Analysis**

Sibley's Office Data-set – 66 cases

| Outcome | Unadjusted Coefficient (90% CI) | Unadjusted P-Value | Adjusted Coefficient (90% CI) | Adjusted P-Value |
|---|---|---|---|---|
| Rent | -9.80 (-21.1, 1.48) | 0.09 | -9.84 (-21.2, 1.50) | 0.09 |

The comparison of the two locations showed that, by 1985, there was some evidence of a difference in rent between the two locations with the statistically significant results at the 9% level (p=0.09). Rents in Camden are about 10 units lower than Westminster. This is the outcome that is predicted and it confirms the central research hypothesis of this thesis, suggesting that the rent in Camden has adjusted downwards to reflect the higher tax burden, leading towards an equalisation of total costs.

The unadjusted and adjusted analyses give almost identical results, which suggests that overall size in the case of offices has little influence on the rent paid (per unit measure). This result may not hold true for retail or industrial property and indeed the theory would suggest that it would not be expected to apply to retail property (due to the progressive decrease in rental value from front to rear) and for industrial property there may be a general quantity discount. However, this factor is assumed to be handled in the matching process (and the zoning of retail property) and no further consideration is given in this thesis to the possibility that there is a non-linear relationship between property size and rent per $m^2$.

## 8.4 PRIMARY ANALYSIS – CROSS-SECTIONAL TESTS

The three tests in the primary analysis are based chiefly on tests of statistical significance, with the use of descriptive statistics as an adjunct to the experimental approach. The statistical tests used and the significance levels adopted were discussed in 8.2.

The approach adopted is the standard null hypothesis significance testing procedure. There have been many criticisms of null hypothesis significance

testing, mostly suggesting when it should *not* be used (Cohen 1995 is a ferocious critic; but see Newton and Rudestam 1999 for a discussion of the arguments). Frick (1996), on the other hand, explores the circumstances when the procedure *is* appropriate and Chow (1996) presents a careful defence of the procedure putting it on a firm logical foundation, which is followed in this thesis. He argues that null hypothesis tests of statistical significance are ideal for 'theory corroboration' and he addresses the major criticisms of the procedure, which frequently stem from inappropriate applications (and an inappropriate choice of **p-value** discussed at 8.2 above).

When setting out statistical hypotheses that test for the difference between two means, it is a convention that the null hypothesis ($H_0$) will test that there is no difference between the two sample means and this is the approach that will be adopted in this thesis. The null hypothesis is 'commonly known as the hypothesis of no difference' (Chow 1996 at p. 3). Using this approach, it is usually expected that the null hypothesis will be rejected and that some alternative hypothesis ($H_1$) will be accepted but, in this work, there are some tests where it is the null hypothesis that is expected to be accepted (implying that the sample means are equal) and, in these cases, no alternative hypothesis is specified.

### 8.4.1 TEST 1: PRE-DIVERGENCE EQUIVALENCE IN 1973

An underlying assumption of the research design is that, in 1973, for any pair of boroughs, the two sets of observations represent different data drawn from the same normally distributed population.

By testing the mean of the 1973 Rateable Value per $m^2$ (acting as a proxy for rental value), the samples were checked to see if both were drawn from the same population before emergence of rate differentials. If there is no difference in rents between the two areas (before the rate burdens diverged) and if the population mean for each area is denoted by $\mu_1$ and $\mu_2$ the following statistical hypothesis can be tested:

Hypothesis 1

$H_0: \mu_1 = \mu_2$

A paired samples t-test is applied and the predicted outcome is that there is no significant difference between samples, i.e. the null hypothesis is accepted.

This pre-divergence test is important, not only because it helps to verify the basic premise of pre-divergence equivalence, but also because it eliminated the need to consider the separate but related problem of high rate areas having low property values. If it can be shown that properties in what became the high rated areas are part of the same population before the tax rate divergence emerged, then no further consideration needs to be given to this issue in the analysis.

Assuming that the matching of pairs dealt adequately with service charge costs, rental values and total occupation costs can be treated as one and the same in 1973. There is no need to take into account the rate burden because the rate poundage at this point in time was not divergent (and there had not been a lengthy period of high differentials in the preceding years).

This test is supported by descriptive statistics to help understand the extent to which rental values (and total occupation costs) were equal in 1973. The average rental values of properties between boroughs are compared to observe the extent to which rental values per $m^2$ (denoted by $Rv_1$ and $Rv_2$) were level before the emergence of high rate differentials:

Hypothesis 2

$H_o: Rv_1 = Rv_2$

Descriptive statistics are calculated. It is predicted that rental values between boroughs will tend towards equality, i.e. the null hypothesis is accepted.

Hypothesis 2 relies on the mean of 1973 Rateable Value per $m^2$ (as a proxy for rental value) and illustrates how total occupation costs (represented by the rental value) are expected to be equalised.

### 8.4.2 TEST 2: POST-DIVERGENCE IMPACT IN 1988

This is one of the key tests for tax capitalisation: if the two sets of measurements for outcome rental value in 1988 can be shown to have been drawn from different sample populations after rates diverged, then the tax can be shown to have been (at least partly) capitalised. It is a basic prediction of this thesis that rental values will adjust to reflect differing rate burdens. This test assumes that any changes that take place reflect adjustments in the direction expected and Test 3 below is designed to confirm that any observed effect is consistent with capitalisation (i.e. takes place in the expected direction).

If the sample was drawn from the same population in 1973 (see 8.4.1), then it is expected that the two sets of observations for each borough will, by 1988, have adjusted to the extent that they no longer represent data drawn from the same normally distributed population.

The mean of the 1988 Rateable Value per $m^2$ was tested following the period of high rate differentials to see if there is a statistically significant difference in rents between the high rated area and the low rated area following the period of divergent rate burdens. If the population mean for each area is denoted by $\mu_1$ and $\mu_2$ the following hypothesis can be tested:

Hypothesis 3

$$H_o: \quad \mu_1 \quad = \quad \mu_2$$

$$H_1: \quad \mu_1 \quad \neq \quad \mu_2$$

A paired samples t-test is applied with the predicted outcome that there is a significant difference between samples, i.e. the null hypothesis is rejected and the alternative hypothesis is accepted.

### 8.4.3 TEST 3: EQUALISATION OF TOTAL OCCUPATION COSTS IN 1988

This is a test of capitalisation. The principal prediction in this work is that, over time, total occupation costs between the high rate and the low rate areas will be equalised. Total occupation costs are defined to comprise rental value plus rate burden. Service charge differences were handled as part of the matching process (see 7.5.2) and are therefore not treated within the definition of total costs.

If there is no difference in total occupation costs between the high rated area and the low rated area, and if the population mean for each area is denoted by $\mu_1$ and $\mu_2$ the following hypothesis can be tested:

Hypothesis 4

$$H_o: \quad \mu_1 \quad = \quad \mu_2$$

A paired samples t-test was applied and the predicted outcome is that there is no significant difference between samples, i.e. the null hypothesis is accepted.

Hypothesis 4 is the Post-test equivalent to Hypothesis 1, which was applied in Test 1, before the rate burdens diverged (see 8.4.1). Hypothesis 1 applied to occupation costs before the emergence of high differences in the tax rate and the proposition is that, for the variable of total occupation costs, the samples will again be drawn from the same population following the period of high tax rate differentials.

Descriptive statistics help to explain the total occupation costs and the sum of the average rental value and the average rate burden are compared to see the extent to which total occupation costs per $m^2$ (denoted by $Oc_1$ and $Oc_2$) have equalised:

Hypothesis 5

$H_o$: $Oc_1$ = $Oc_2$

Descriptive statistics are calculated. It is predicted that total occupation costs will tend towards equalisation, i.e. the null hypothesis is accepted.

Hypothesis 5 illustrates how total occupation costs are expected to be equalised and, by taking the mean of 1988 Total Occupation Costs per $m^2$, it is possible to see whether, after the period of equalisation, properties in the two boroughs now share equal total occupation costs.

### 8.4.4 PRIMARY ANALYSIS OF 1985 PILOT STUDY SUBSET

The pilot study discussed in 8.3 is based on office data for actual lettings in the City of Westminster and the London Borough of Camden. The three tests that together make up the primary analysis set out above were applied using the 1985 data subset from Table 8.2. There were 34 properties in the subset, made up of 17 in each borough, but these properties were not matched into pairs and an independent samples t-test was applied to the analysis of these data in place of the paired samples t-test that was specified for the main data analysis.

In Westminster and Camden, like the other London boroughs used for this study, there was marked divergence of rate burdens after 1979 (see Figure 5.7).

First, the data-set was tested for equivalence in 1973, at the beginning of the period using the test that was explained in 8.4.1.

**Table 8.5: Pre-Divergence Equivalence in 1973**

Sibley's 1985 Office Data-set – 34 cases

**Variable:** 1973 Rental Value per $m^2$

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Westminster | 17 | 33.59 | 9.303 | 2.256 |
| Camden | 17 | 35.94 | 10.667 | 2.587 |

| Independent Samples T-Test | t Value | Degrees of Freedom | 2-tailed P-Value |
|---|---|---|---|
| Equality of mean values | -0.684 | 32 | .499 |

This test of Hypothesis 1 confirms the underlying assumption that the data were drawn from the same population of properties in 1973 before the rate burdens diverged (p=0.499). The null hypothesis ($H_0$) is accepted, there being no statistically significant relationship, and this is the predicted outcome.

Table 8.5 also shows the average rental value per $m^2$ for office property in 1973, representing a test of Hypothesis 2. There is a difference between boroughs of 6.5%, with Camden (the eventual high rate borough) having a slightly higher rental value base.

As well as being a test of rental value equivalence in 1973, this can also be viewed as a test for parity of total occupation costs at that date (discussed at 8.4.1).

The next stage of the analysis is to compare the difference between locations in 1985, using the test described in 8.4.2.

**Table 8.6: Post-Divergence Impact in 1985**

Sibley's 1985 Office Data-set – 34 cases

**Variable:** 1985 Rent per $m^2$

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Westminster | 17 | 154.52 | 25.925 | 6.2878 |
| Camden | 17 | 131.52 | 21.032 | 5.1009 |

| Independent Samples T-Test | t Value | Degrees of Freedom | 2-tailed P-Value |
|---|---|---|---|
| Equality of mean values | 2.840 | 32 | .08 |

Table 8.6 shows the results of testing Hypothesis 3 to see if the rents have diverged in 1985, following the period of rate differentials. The null hypothesis ($H_0$) is rejected and the alternative hypothesis ($H_1$) is accepted. The results confirm the prediction that rental values will adjust to reflect the differing rate burden and this is confirmed at the 8% significance level. The result presented here is slightly stronger than the result obtained from the regression analysis that was applied to the whole data-set (see Table 8.4), where a significance level of 9% was found for the equivalent test of post-divergence impact for 1983–1985.

The final stage of the analysis is to apply the tests described in 8.4.3, which are designed to test for equalisation of total occupation costs.

**Table 8.7: Total Occupation Costs in 1985**

Sibley's 1985 Office Data-set – 34 cases

**Variable:** Total Occupation Costs per $m^2$ (Rent + Rate Burden)

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Westminster | 17 | 211.22 | 29.292 | 7.1043 |
| Camden | 17 | 213.32 | 36.398 | 8.8277 |

| Independent Samples T-Test | t Value | Degrees of Freedom | 2-tailed P-Value |
|---|---|---|---|
| Equality of mean values | -0.186 | 32 | .854 |

Table 8.7 shows a result for Hypothesis 4 that is not statistically significant (p=0.854), which is the predicted outcome ($H_0$ is accepted). The result suggests that the total occupation costs for the properties across the two boroughs are part of the same population. This evidence tends to confirm the central research hypothesis of this thesis, namely that total occupation costs are equalised.

**Table 8.8: Equalisation of Total Occupation Costs in 1985**

Sibley's 1985 Office Data-set – 34 cases

| Cost | Number of Cases | Westminster | Camden | Percentage Difference |
|---|---|---|---|---|
| Average Rate Burden | 17 | £56.70 $m^2$ | £81.80 $m^2$ | 30.7% |
| Average Rental Value | 17 | £154.52 $m^2$ | £131.52 $m^2$ | -17.5% |
| Total Occupation Costs | | £211.22 $m^2$ | £213.32 $m^2$ | 1.0% |

Table 8.8 shows the results from testing Hypothesis 5. The comparison of total occupation costs shows that, even by 1985, the combination of rent plus rate burden was equalised for the sample data used here.

A comparison of total costs was also undertaken by Sibley in his own study but his methodology did not isolate the results in this way; nor did Sibley use any statistical tests to validate and support his findings.

The strength of these findings is a strong validation of the Pre-test/Post-test design and the cross-sectional statistical methodology that is used in this study. The use of market letting data provides triangulation of the results.

Pilot study data were not checked or verified and Sibley made no attempt to match his data into pairs, (although he did select an equal number of properties for each year in his data-set). Nevertheless, the results show that, by 1985, the influence of the differences in rate burden was apparent in rents, through the different level of rents between locations.

It is expected that the impact of high rates will be more clearly shown in the main study in 1988, due both to the controls that are imposed by the use of matched pairs, as well as the extra time that has elapsed to allow for the adjustment. Table 8.9 shows an extract from the Investors Chronicle/Hillier Parker (ICHP) Rent Index. The index for the period 1985–1988 confirms that this was a period of high rental growth.

**Table 8.9: ICHP Rent Index – 1983–1988**

Offices – London Mid-Town

| | *1983* | *1984* | *1985* | *1986* | *1987* | *1988* |
|---|---|---|---|---|---|---|
| Q1 | 40 | 40 | 44 | 50 | 59 | 92 |
| Q2 | 40 | 40 | 47 | 51 | 63 | 100 |
| Q3 | 40 | 40 | 48 | 53 | 73 | 108 |
| Q4 | 40 | 41 | 49 | 55 | 85 | 116 |

Source: CB Hillier Parker (ICHP 1989)

Table 8.9 also reveals that the 1983–1985 period, covered by Sibley's data, was a time of comparatively low rental growth, which may also help to explain the weaker results obtained when making the regression analysis that included data from earlier years (see 8.3.2 above and also Sibley 1989).

## 8.5 PRIMARY INDUSTRIAL PROPERTY ANALYSIS

The industrial property was located in the London Boroughs of Enfield and Haringey. Figure 5.5 illustrated the diverging rate burden in Enfield and Haringey for the period under study.

The tables that follow show the results from the analysis of Data-set A1 (see Table 7.4), which contains fully matched industrial property pairs. These results can be compared to the results in Appendix 8, which sets out the same analysis for the partly matched pairs in Industrial Data-set A2.

The first stage in the analysis was to see if the properties were drawn from the same population in 1973 using Test 1 which is explained in 8.4.1.

**Table 8.10: Pre-Divergence Equivalence in 1973**

Industrial Data-set A1: Fully matched pairs: 70 cases, 35 pairs

**Variable:** 1973 Rental Value per $m^2$

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Enfield | 35 | 6.98 | 1.604 | .2711 |
| Haringey | 35 | 6.76 | 1.163 | .1965 |

| Paired Samples T-Test | t Value | Degrees of Freedom | P-Value |
|---|---|---|---|
| Equality of mean values | .696 | 34 | .491 |

Table 8.10 shows the results from testing Hypothesis 1 for industrial property. The result is not statistically significant (p=0.491) and the null hypothesis is accepted. This conforms to the predicted outcome and confirms the hypothesis that the data within Industrial Data-set A1 are drawn from the same population of properties in 1973, before the rate burdens diverged.

**Table 8.11: Equality of Total Occupation Costs in 1973**

Industrial Data-set A1: Fully matched pairs: 70 cases, 35 pairs

**Variable:** 1973 Rental Value per $m^2$

| Cost | Number of Pairs | Enfield | Haringey | Percentage Difference |
|---|---|---|---|---|
| Average Rental Value | 35 | £6.98 $m^2$ | £6.76$m^2$ | -3.3% |

Hypothesis 2 is tested in Table 8.11. The average rental value per $m^2$ for industrial property in 1973 (using rateable value as a proxy) can be seen to be close, with a small difference between boroughs of 3.3%, with Haringey having slightly lower values.

The results of the Pre-Test analysis for industrial property suggest no evidence of any difference between locations in 1973, which means we can now discuss the suggestion that high rate areas have lower rents. The next stage in the analysis was to compare the difference in locations in 1988 using Test 2, as discussed in 8.4.2.

**Table 8.12: Post-Divergence Impact in 1988**

Industrial Data-set A1: Fully matched pairs: 70 cases, 35 pairs

**Variable:** 1988 Rental Value per $m^2$

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Enfield | 35 | 42.88 | 12.96 | 2.189 |
| Haringey | 35 | 38.42 | 7.68 | 1.298 |

| Paired Samples T-Test | t Value | Degrees of Freedom | 2-tailed P-Value |
|---|---|---|---|
| Equality of mean values | 1.968 | 34 | .057 |

The results of testing Hypothesis 3 are shown in Table 8.12 with the null hypothesis rejected, this being the predicted outcome. The alternative hypothesis ($H_1$) is accepted and this applies at a 5.7% level of significance,

at which level the prediction that the level of rents has adjusted to reflect the differing rate burden is confirmed. This provides strong support for the underlying hypothesis that, over time, property tax burdens are capitalised.

Finally, the analysis set out in 8.4.3 (Test 3) is undertaken to see if Total Occupation Costs in 1988 are equalised.

**Table 8.13: Total Occupation Costs in 1988**

Industrial Data-set A1: Fully matched pairs: 70 cases, 35 pairs

**Variable:** Total Occupation Costs per $m^2$ (Rent + Rate Burden)

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Enfield | 35 | 55.82 | 15.561 | 2.6303 |
| Haringey | 35 | 56.65 | 10.133 | 1.7128 |

| Paired Samples T-Test | t Value | Degrees of Freedom | 2-tailed P-Value |
|---|---|---|---|
| Equality of mean values | -0.298 | 34 | .768 |

Table 8.13 shows the results of testing Hypothesis 4. The results are not statistically significant (p=0.768), leading to acceptance of the null hypothesis, which is the predicted outcome. This suggests that the total occupation costs for the properties in the data-set across the two boroughs are part of the same population. This finding provides strong support for the hypothesis that total occupation costs, over time, will be equalised.

**Table 8.14: Equalisation of Total Occupation Costs in 1988**

Industrial Data-set A1: Fully matched pairs: 70 cases, 35 pairs

**Variable:** Total Occupation Costs per $m^2$ (Rent + Rate Burden)

| Cost | Number of Cases | Enfield | Haringey | Percentage Difference |
|---|---|---|---|---|
| Average Rate Burden | 35 | £12.94 $m^2$ | £18.23 $m^2$ | 29.0% |
| Average Rental Value | 35 | £42.88 $m^2$ | £38.42 $m^2$ | -11.6% |
| Total Occupation Costs | | £55.82 $m^2$ | £56.65 $m^2$ | 1.5% |

Table 8.14 is a test of Hypothesis 5, which is accepted. This shows that total occupation costs between the two boroughs have tended to be equalised, with only a 1.5% difference between total costs in 1988, following the period of high rate differentials. These results provide further confirmation of the hypothesis that total occupation costs will be equalised, given sufficient time for the rents to adjust.

## 8.6 PRIMARY RETAIL PROPERTY ANALYSIS

Retail property in Data-set C1 (see Table 7.5) is located in the London Boroughs of Barnet and Brent, where there was marked divergence of rate burdens after 1979 (see Figure 5.6).

Again, the first stage of analysis was to test for differences between locations in 1973. This is Test 1, which is explained in 8.4.1.

**Table 8.15: Pre-Divergence Equivalence in 1973**

Retail Data-set C1: Fully matched pairs: 42 cases, 21 pairs

**Variable:** 1973 Rental Value per $m^2$

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Barnet | 21 | 17.15 | 3.407 | 0.7434 |
| Brent | 21 | 17.79 | 2.441 | 0.5328 |

| Paired Samples T-Test | t Value | Degrees of Freedom | 2-tailed P-Value |
|---|---|---|---|
| Equality of mean values | -0.666 | 20 | .513 |

Table 8.15 shows the results from the testing of Hypothesis 1 for retail property using Data-set C1, containing fully matched retail property pairs. The result is not statistically significant (p=0.513) and the null hypothesis is accepted, which is the predicted outcome. This confirms the assumption that the data within Retail Data-set C1 are drawn from the same population of properties in 1973, before the rate burdens diverged.

**Table 8.16: Equality of Total Occupation Costs in 1973**

Retail Data-set C1: Fully matched pairs: 42 cases, 21 pairs

**Variable:** 1973 Rental Value per $m^2$

| Cost | Number of Pairs | Barnet | Brent | Percentage Difference |
|---|---|---|---|---|
| Average Rental Value | 21 | £17.15 $m^2$ | £17.79$m^2$ | 3.6% |

In Table 8.16 the average rental value per $m^2$ for retail property in 1973 can be seen to be close, with a small difference between boroughs of 3.6% for Hypothesis 2. In this case, Brent (which later becomes the high rate borough), has a slightly higher level of rental values than Barnet.

The results of the Pre-Test analysis for retail property, shown in Tables 8.15 and 8.16, suggest no evidence of any significant difference between locations and this suggested that it was worthwhile to examine the outcome variables in 1988. The second stage of the analysis was to compare the difference in locations in 1988.

**Table 8.17: Post-Divergence Impact in 1988**

Retail Data-set C1: Fully matched pairs: 42 cases, 21 pairs

**Variable:** 1988 Rental Value per $m^2$

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Barnet | 21 | 125.45 | 23.173 | 5.0567 |
| Brent | 21 | 114.89 | 10.639 | 2.3217 |

| Paired Samples T-Test | t Value | Degrees of Freedom | 2-tailed P-Value |
|---|---|---|---|
| Equality of mean values | 1.822 | 20 | .083 |

Table 8.17 shows the results of testing Hypothesis 3 for retail property. The null hypothesis for Test 2 is rejected and the alternative hypothesis ($H_1$) is

accepted at an 8.3% level of significance, which is in line with the predicted outcome that the level of rents will adjust to reflect the differing rate burden. This provides support for the underlying hypothesis that, over time, property tax burdens are capitalised.

The final stage of the analysis is to compare Total Occupation Costs in 1988 to see if they are equalised (see 8.4.3).

**Table 8.18: Total Occupation Costs in 1988**

Retail Data-set C1: Fully matched pairs: 42 cases, 21 pairs

**Variable:** Total Occupation Costs per $m^2$ (Rent + Rate Burden)

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Barnet | 21 | 157.16 | 27.025 | 5.8974 |
| Brent | 21 | 152.86 | 14.580 | 3.1815 |

| Paired Samples T-Test | t Value | Degrees of Freedom | 2-tailed P-Value |
|---|---|---|---|
| Equality of mean values | .619 | 20 | .543 |

Table 8.18 shows the results of testing Hypothesis 4, which confirms the prediction that the average total occupation costs across the borough boundary are drawn from the same population (p=0.543). The result confirms the null hypothesis, which was the predicted outcome and this provides strong support for the hypothesis that total occupation costs will be equalised, given sufficient time for the rents to adjust.

**Table 8.19: Equalisation of Total Occupation Costs in 1988**

Retail Data-set C1: Fully matched pairs: 42 cases, 21 pairs

**Variable:** Total Occupation Costs per $m^2$ (Rent + Rate Burden)

| Cost | Number of Cases | Barnet | Brent | Percentage Difference |
|---|---|---|---|---|
| Average Rate Burden | 21 | £31.71 $m^2$ | £37.97 $m^2$ | 16.5% |
| Average Rental Value | 21 | £125.45 $m^2$ | £114.89$m^2$ | -9.2% |
| Total Occupation Costs | | £157.16 $m^2$ | £152.86 $m^2$ | -2.8% |

Table 8.19 is a test of Hypothesis 5 which shows that total occupation costs per $m^2$ tend to be equalised for retail property. Total occupation costs in Brent are 2.8% lower than in Barnet in 1988 following the period of high rate differentials. Again, this finding provides confirmation of the hypothesis that total occupation costs will be equalised, given sufficient time for the rents to adjust.

## 8.7 PRIMARY OFFICE PROPERTY ANALYSIS

Data-set E1 (see Table 7.6) contains fully matched pairs of office properties in the City of Westminster and the London Borough of Camden, which are the same boroughs that were used for the pilot study (see 8.3). Like the other London boroughs used in this thesis, there was marked divergence of rate burdens after 1979 between Westminster and Camden (see Figure 5.7).

Firstly, the pre-divergence analysis was undertaken to see if the properties were drawn from the same population in 1973.

**Table 8.20: Pre-Divergence Equivalence in 1973**

Office Data-set E1: Fully matched pairs: 42 cases, 21 pairs
**Variable:** 1973 Rental Value per $m^2$

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Westminster | 21 | 34.89 | 9.059 | 1.977 |
| Camden | 21 | 36.48 | 17.062 | 3.723 |

| Paired Samples T-Test | t Value | Degrees of Freedom | 2-tailed P-Value |
|---|---|---|---|
| Equality of mean values | .362 | 20 | .721 |

Table 8.20 shows the results from testing Hypothesis 1 for office property using Data-set E1 containing fully matched pairs. The null hypothesis for Hypothesis 1 is accepted (p=0.721), which is the predicted outcome. This confirms the underlying premise that the data within Office Data-set E1 were drawn from the same population in 1973, before rate burdens diverged.

**Table 8.21: Equality of Total Occupation Costs in 1973**

Office Data-set E1: Fully matched pairs: 42 cases, 21 pairs

**Variable:** 1973 Rental Value per $m^2$

| Cost | Number of Pairs | Westminster | Camden | Percentage Difference |
|---|---|---|---|---|
| Average Rental Value | 21 | £34.89$m^2$ | £36.48$m^2$ | 4.4% |

Table 8.21 shows the average rental value per $m^2$ for office property in 1973. The rents are close, with a difference between boroughs of 4.4%. This is the largest pre-divergence difference between boroughs for Hypothesis 2 (for the primary analysis). Camden has a slightly higher rental value base in 1973, and as with retail property in Barnet/Brent, the borough with the highest rate burden in 1988 is starting with a slightly higher rental value base in 1973.

The results of the Pre-Test analysis for office property suggest no evidence of any significant difference between locations in 1973 and the overall results from the pre-divergence investigation suggested that it was acceptable to move on to test the 1988 outcome variables. The next stage in the analysis was to compare the differences in locations at that time.

**Table 8.22: Post-Divergence Impact in 1988**

Office Data-set E1: Fully matched pairs: 42 cases, 21 pairs

**Variable:** 1988 Rental Value per $m^2$

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Westminster | 21 | 294.66 | 51.239 | 11.181 |
| Camden | 21 | 264.56 | 38.559 | 8.414 |

| Paired Samples T-Test | t Value | Degrees of Freedom | 2-tailed P-Value |
|---|---|---|---|
| Equality of mean values | -2.078 | 20 | .051 |

Table 8.22 is a test of Hypothesis 3, in which the null hypothesis is rejected. This is the predicted outcome and, for office property, the alternative hypothesis ($H_1$) is confirmed at a 5.1% significance level. It confirms the prediction that rental values will adjust to reflect the differing rate burden. This provides strong support for the underlying hypothesis that, over time, property tax burdens are capitalised.

Finally the analysis set out in 8.4.3 (Test 3) is undertaken to see if Total Occupation Costs in 1988 are equalised.

**Table 8.23: Total Occupation Costs in 1988**

Office Data-set E1: Fully matched pairs: 42 cases, 21 pairs

**Variable:** Total Occupation Costs per $m^2$ (Rent + Rate Burden)

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Westminster | 21 | 351.49 | 57.550 | 12.559 |
| Camden | 21 | 349.08 | 68.215 | 14.886 |

| Paired Samples T-Test | t Value | Degrees of Freedom | 2-tailed P-Value |
|---|---|---|---|
| Equality of mean values | -1.12 | 20 | .912 |

Table 8.23 shows the results of testing for Hypothesis 4. The results are not statistically significant (p=0.912) so the null hypothesis is accepted. This suggests that for the outcome variable of total occupation costs, the sample properties across the borough boundary are drawn from the same population. This finding provides strong support for the hypothesis that total occupation costs will be equalised, given sufficient time for the rents to adjust.

**Table 8.24: Equalisation of Total Occupation Costs in 1988**

Office Data-set E1: Fully matched pairs: 42 cases, 21 pairs

**Variable:** Total Occupation Costs per $m^2$ (Rent + Rate Burden)

| Cost | Number of Cases | Westminster | Camden | Percentage Difference |
|---|---|---|---|---|
| Average Rate Burden | 21 | £56.83 $m^2$ | £84.52 $m^2$ | 32.7% |
| Average Rental Value | 21 | £294.66 $m^2$ | £264.56 $m^2$ | -11.4% |
| Total Occupation Costs | | £351.49 $m^2$ | £349.08 $m^2$ | -0.7% |

The results of testing Hypothesis 5 are shown in Table 8.24. The null hypothesis is accepted, as predicted. This shows that total occupation costs between the two boroughs have tended to be equalised, with only a 0.7% difference between total costs in 1988 following the period of high rate differentials. The total costs in Westminster are slightly higher than the costs in Camden which provides support for the hypothesis that total occupation costs will be equalised, given sufficient time for the rents to adjust.

In the case of office properties, the post-divergence results can be compared to the results of the pilot study shown in Tables 8.7 and 8.8, which shows the position for office property in the same locations in 1985. These are pilot study data and they are for different properties but a comparison of the results suggests that a progressive equalisation of total occupation costs is taking place over time. They also provide triangulation of the results from the analysis using rental proxy data against market letting data.

## 8.8 SECONDARY ANALYSIS – RENTAL GROWTH TEST

Due to the difficulty of obtaining and maintaining a consistent single data-set over the time frame of this research, the secondary analysis uses a different data-set to the primary analysis (see 6.7). This secondary analysis is designed to give additional insights into the tax capitalisation effect over time. This is a longitudinal test which goes beyond the cross-sectional approach that is adopted for the primary analysis, although it is intended only to supplement that analysis and is therefore not as comprehensively specified.

It has been emphasised that the process of adjustment of rents to reflect higher business rates takes a long time and that it will come about through changes in the rate of rental value growth. Given the equalisation of total occupation costs that took place between 1973 and 1988, it is expected that rental growth between high rate and low rate areas will differ following the introduction of the Uniform Business Rate. This is caused by the upward adjustment of previously depressed rents in the high rate area. The formerly low rate areas are expected to show lower annual rental growth than high rate areas.

This secondary investigation will give an added dimension to the empirical study and help to explain the impact of the Uniform Business Rate (UBR) on property values in the period 1988–1998.

### 8.8.1 TEST 4: DIFFERENTIAL RENTAL GROWTH TEST

By calculating rental growth (Rg) based on the overall rateable value (acting as a proxy for rental value), a test is made that is independent of the size observation. This made it possible to use a larger data-set for the secondary analysis (by removing the need to collect size measurements) and it also provided a cross-check against the primary analysis that does not rely on the measurement of size (see Appendix 9).

In the hypotheses below, the sample from the area that had low rates in the past (Pre-UBR) is denoted by $Rg_1$ and the sample from the area that had high rates by $Rg_2$:

Hypothesis 6

$H_0: \quad Rg_1 = Rg_2$

$H_1: \quad Rg_1 < Rg_2$ (Post-UBR growth)

$H_2: \quad Rg_1 > Rg_2$ (Pre-UBR growth)

By calculating the average annual rental growth between the two samples for each property type, the difference in rental growth can be investigated.

It is expected that the rate of rental growth between boroughs will differ. For the 1988–98 analysis it is expected that there will be higher rental growth in the formerly high rate area, i.e. the null hypothesis is rejected and the alternative hypothesis ($H_1$) is accepted. Where the test is applied to data for the period 1973–1988, it is expected that higher growth rates will be found in the low rate borough and this is represented by Hypothesis $H_2$.

The annual rate of rental growth is calculated as the compound annual growth rate.

### 8.8.2 SECONDARY ANALYSIS OF 1985 PILOT STUDY SUBSET

Once again, the pilot data that were used to validate the methodology and to triangulate the results against market data were used to evaluate the proposed approach. Taking the same 1985 subset of pilot data that was used to test the primary analysis (see 8.3.1), a calculation was made for rental growth for the period 1973–1985, in the terms of Test 4 set out above.

It should be noted that the results of this growth analysis for the pilot data do not add to the results set out in 8.4.4. The primary analysis of the pilot data provided strong evidence to support the hypothesis that the UK property tax is capitalised: if rents between locations were the same in 1973 and had diverged by 1985 (1988 for the main analysis), it automatically follows that rates of rental growth must also have diverged (given the measurement at only two points in time). Consequently, there is no analytical purpose in carrying out this rental growth test for the primary data. It is calculated here in order to prove the efficacy of Test 4 and to provide triangulation of results against market data.

The annual rental growth was calculated for the period 1973 through to the date of the market letting in 1985, but only the outcome variable of rent in

1988 is based on a market letting. The 1973 Rateable Value is used as a proxy for rental value in 1973.

**Table 8.25: Average Annual Rental Growth – 1973–1985**

Sibley's 1985 Office Data-set – 34 observations

| Local Authority | Cases | 1973–1985 |
|---|---|---|
| Westminster | 17 | 13.8% pa |
| Camden | 17 | 11.8% pa |

The results shown in Table 8.25 are, as predicted, that rental growth in Westminster is higher than rental growth in Camden ($H_2$ is accepted). This result suggested that it would be worthwhile to collect and analyse data for the period following the introduction of the Uniform Business Rate in 1990, a period for which the primary analysis provides no answers.

It has already been explained that there is little analytical advantage in making this rental growth analysis for the primary data. However, the growth calculation itself is carried out without regard to property size and Appendix 9 contains an analysis of growth for the primary data over the period 1973–1988. This is presented as a confirmatory analysis, and it is included in this thesis as a check on the primary results because size is the least accurately measured of the four chief variables (see 7.4).

### 8.8.3 DIFFERENTIAL RENTAL GROWTH – 1988–98

The data collected for this test used the same principles that were established in Chapter 6, with the rateable value acting as a proxy for rental value.

Since the Uniform Business Rate was introduced in 1990, there have been two additional revaluations, the first in 1995 and the most recent in 2000. The variables used for the calculation of rental growth are the rateable value in 1990, the rateable value in 1995 and the rateable value in 2000. Just as the 1990 Rating List was based on an antecedent valuation date of April 1988,

so the subsequent rating lists have been based on a valuation date that is two years earlier (see A2.5 and Figure 1.1). The 1995 Rating List is based on values in April 1993 and the 2000 Rating List is based on values in April 1998: rental value proxy is therefore based on valuation dates of April 1988, April 1993 and April 1998.

The chief test for differential rental growth covers rental values in the period 1988–1998 and it was applied to a different set of data to that which was collected for the primary analysis. Rental growth is calculated separately for three periods, 1988–1993, 1993–1998 and for the whole period 1988–1998. This shows rental growth over a period of ten years.

One specific anomaly that is not addressed in this analysis is the fact that Uniform Business Rates were not introduced until 1990, yet the initial rental value observations are from 1988. The survey of occupiers (see Appendix 6) showed that occupiers were unlikely to have reflected expected future rate burdens in their rental bids before 1990. This means that the period of time in which rental growth rates can adjust to reflect the elimination of rate differentials is eight years, not ten, as might be implied by the data.

A second factor that was ignored in this analysis of rental growth is the impact of Transitional Relief (see A1.4). Increases (and decreases) in rate burden were phased in following the introduction of each new rating list under the new system. No account is taken of this phasing in the secondary analysis presented here.

**Table 8.26: Average Annual Rental Growth – 1988–1998**

Industrial Data-set B: part matched pairs: 170 cases, 85 pairs

| Local Authority | Cases | 1988–1993 | 1993–1998 | 1988–1998 |
|---|---|---|---|---|
| Enfield | 85 | 0.6% pa | 0.9% pa | 0.7% pa |
| Haringey | 85 | 1.5% pa | 1.2% pa | 1.2% pa |

Table 8.26 is a test of Hypothesis 6 for industrial property, with the expectation that alternative hypothesis ($H_1$) will be accepted. This predicts that rental growth will be higher in Haringey than in Enfield. For the whole period 1988–1998, the annual rental growth in Haringey is 0.5% higher than in Enfield. For all periods calculated, the annual average rental growth is higher in Haringey than Enfield, which confirms the hypothesis.

**Table 8.27: Average Annual Rental Growth – 1988–1998**

Retail Data-set D: part matched pairs: 174 cases, 87 pairs

| Local Authority | Cases | 1988–1993 | 1993–1998 | 1988–1998 |
|---|---|---|---|---|
| Barnet | 87 | 0.4% pa | 1.2% pa | 0.8% pa |
| Brent | 87 | 4.2% pa | 1.1% pa | 2.6% pa |

Table 8.27 is a test of Hypothesis 6 for retail property, again with the expectation that alternative hypothesis ($H_1$) will be accepted. This predicts that rental growth will be higher in Brent than Barnet. For the whole period 1988–1998, the annual rental growth in Brent is 1.8% higher than in Barnet, confirming the hypothesis for the overall period. For the other periods calculated, the annual average rental growth varies, being nearly 4.0% higher in Brent in the period 1988–1993, but during the period 1993–1998 rental growth is slightly higher in Barnet (the low rate borough) than in Brent (by 0.1%). Such a small difference is not considered relevant in the context of the overall results obtained.

**Table 8.28: Average Annual Rental Growth – 1988–1998**

Office Data-set F: part matched pairs: 64 cases, 32 pairs

| Local Authority | Cases | 1988–1993 | 1993–1998 | 1988–1998 |
|---|---|---|---|---|
| Westminster | 32 | -16.3% pa | 6.9% pa | -5.4% pa |
| Camden | 32 | -6.9% pa | 6.4% pa | -0.5% pa |

Table 8.28 shows the results from testing Hypothesis 6 for office property, again with the expectation that alternative hypothesis ($H_1$) will be accepted. This predicts that rental growth will be higher in Camden than Westminster.

Rental growth for the whole period 1988–1998 in both Camden and Westminster is negative, but the negative growth rate is still nearly 5.0% per annum lower in Camden than in Westminster, confirming the hypothesis for the overall period. For the intermediate periods, the annual average rental growth varies. For the period 1988–1993 rental growth is negative in both boroughs with a difference in annual rental growth between boroughs of nearly 10%, and again, the negative growth takes place in accordance with the predictions of the hypothesis, with a lower rate of negative growth in Camden. Negative growth in this period is attributed to the 1988–1994 property recession. Growth in the period 1993–1998 is positive, with a slightly higher rate of growth in Westminster (0.5% per annum). It may be that the sharp fall in rental values in Westminster during the first period is being adjusted in the subsequent period, although the magnitude of the adjustment does not fully account for the fall in values in the previous period. This result must be viewed in the context of the overall results, which clearly show that Camden experienced better rental value growth, in accordance with the predicted outcome for this test.

The property recession is certainly likely to have affected the results of the secondary analysis for all three property types and other factors will also influence rents. These are not held constant in this analysis, which is not intended to be as rigorous as the primary analysis.

Another explanation of the negative growth shown for office property and for the generally small differences shown between boroughs could be the impact of Transitional Relief (see Appendix 1) which has not been controlled for in the analysis, and which implicitly assumes level rate burdens between properties across the borough boundary. Transitional Relief applies to the tenant and not the property (but this analysis is undertaken at property unit level without regard to the tenant).

## 8.9 CONCLUSIONS

The combined results presented in this chapter provide strong evidence to support the central hypothesis of this thesis: that the UK property tax is capitalised into property values. Indeed, in statistical terms, the results suggest that the extent to which property taxes are capitalised over time does not differ significantly from 100%. This is confirmed for all three types of property that are included in the empirical research, albeit with differing levels of significance, ranging from just over 5% in the case of offices to better than 9% in the case of retail (for the outcome variable of rent in 1988). These results are supported by the finding that total occupation costs do tend to be equalised in the long term.

The results of the primary analysis are supported by the secondary analysis of rental value growth, which brings a longitudinal dimension to the study and presents results for the period 1988–1998 following the introduction of the Uniform Business Rate.

By adopting a series of statistical significance tests supported by descriptive statistics and other tests, no undue reliance is placed on any single analytical technique. Statistical tests of significance provide an objective measure in the verification of hypotheses, but they do not on their own provide a full explanation of the results. The statistical tests have been augmented by comparative information to confirm and support the chief findings, but the use of critical judgement in considering the results is paramount and the concluding chapter of this thesis summarises the key findings and discusses their significance, relating them to the theory and considering them in the light of previous empirical research.

# CHAPTER 9

# CONCLUSIONS AND DISCUSSION

## 9.1 INTRODUCTION

This thesis has examined the effect of the UK business property tax on business property values in London: specifically whether and to what extent the tax is transferred into rents and thus capitalised.

The final chapter restates the research problem and reviews the methodology used in this study. This is followed by a summary of the results, a discussion of their relationship to the empirical literature and their implications for property owners and also for government tax policy. Finally, consideration is given to areas for further research.

## 9.2 RESEARCH PROBLEM AND METHODOLGY USED

Taxation today is by far the most important source of government revenue and business rates are the fifth largest source of tax revenue, representing 5% of the total.

Taxes represent a transfer of resources from the private sector to the public sector and in the process they may introduce distortions into the economy and impose an additional burden on the community, over and above the amount of tax paid. This thesis has examined the possible impacts of the property tax and has explored the extent to which the UK property tax is shifted in to rents and thus capitalised.

Business rates in England were the subject of major reform in 1990 and, by taking advantage of the circumstances of this change, it was possible to examine the impact of the tax on business property values. Prior to the change there were wide discrepancies in the tax rates between otherwise comparable properties. Rental differences between these properties and how they have adjusted in response to the tax have allowed the tax impact to be investigated.

The central research hypothesis can be stated as follows:

*Following a period of years during which differing property tax burdens are applied to otherwise comparable properties, the rental values of those properties will adjust to a level whereby total occupation costs are equalised.*

Chapters 2 and 3 provided the theoretical background to the research question and a review of the empirical literature was made in Chapter 4. Chapter 5 outlined the practical and political aspects of the UK property tax. The empirical study carried out for this thesis was presented in Chapters 6, 7 and 8.

The theory of rental value determination was considered in Chapter 2. A model of rental value determination was developed and used to explain how a tax on occupiers would affect rental values. Chapter 2 also identified and discussed the three property types used in the empirical study and a review of demand and supply effects on rental value determination was made for each.

In Chapter 3 the economics of taxation and tax capitalisation were reviewed and a model of tax capitalisation was developed. A critical evaluation was made in Chapters 3 and 4 of the literature on tax capitalisation. Most of the theoretical literature originates in the US where the debate has been focussed on residential property and what applies in the US context cannot be taken as automatically applying in the UK, where there are fewer local authorities and a much greater homogeneity between local services (Evans 1985). This uniformity has tended to increase with greater centralisation and there are fewer and fewer opportunities for differentiation in local authority services in the UK, particularly to the business sector. This trend acts to neutralise any differential benefit effects that may arise between local authority areas, especially in London, where key services to business occupiers are provided across the conurbation (e.g. fire, police).

Chapter 4 contained a careful review of the important property tax studies that have been made in both the US and the UK. Each study was categorised according to its geographical area, the property type and the underlying data approach used. The categories for approach used included

both micro and macro data as well as studies of a tax change. Whilst there is a considerable body of literature devoted to residential property, there are few studies that consider business property. This is the least well developed part of the literature in both the UK and the US.

The study carried out in this thesis is a contribution to the literature in the category of micro-studies of business property tax capitalisation, based on the circumstances existing as a result of a tax change. The unit of observation is the individual property and the analysis considers inter-jurisdictional tax differences.

Each study reviewed in Chapter 4 was different but several themes emerged repeatedly. The time horizon used for the analysis was too short; the analysis was frequently at the wrong scale, using aggregate data at a national or regional level; the data were inadequate or difficult to obtain (and where obtained were often inappropriate to the problem); the modelling technique used was unsuitable or flawed in its implementation.

Chapter 5 examined the practical aspects of the UK property tax. It gave a brief overview of the technical aspects of the UK tax (expanded in Appendix 1) and reviewed the political circumstances leading to the 1990 reforms. In this chapter, the six London boroughs used in the empirical research were identified and discussed.

In Chapter 6 the research problem was defined, the methodology developed and the data requirements discussed. Chapter 7 considered the availability of data. This thesis uses micro-level data for individual properties to investigate the extent to which business rates are transferred into lower rental values (and are thus capitalised).

The possibility of benefits being received in return for the tax payment was discussed in 6.4. The differential benefits to business occupiers between local authority areas are likely to be small and the evidence suggests that the important business-focused services are homogenous between London boroughs. Consequently, tax benefits were not explicitly taken into account in the analysis.

The methodology used one important new technique, this being the adoption of rateable value as a proxy for rental value. Great care was taken to verify this approach and the results achieved were triangulated against actual letting observations. The assumptions embodied in the data were tested in Chapter 7 and the pilot study results presented in Chapter 8 were undertaken using market data to verify and validate both the statistical approach adopted and the results obtained. The adoption of a proxy is a useful approach in the context of business property and it avoids the problems of data availability experienced continually in this field. Used with appropriate caution, this technique could be applied to future research projects in the business property arena.

A unique feature of the selected rental value proxy is that it can be used to provide complete knowledge of (estimated) rental value for all business properties. There are several benefits of the approach: all rental value estimates are based on the same assumptions and the same letting terms (the hypothetical tenancy); it makes no difference if a property is vacant, let or owner-occupied; there is no need for adjustments resulting from contractual differences between lettings (which are only possible if the information is available in the first place); and there is no need to rely on estimates of rental value that are made for portfolio valuation purposes, where different valuers make their estimates on different assumptions that reflect their individual biases. Finally, provided the rating valuation dates are acceptable, there is no need to rebase the rental value observations against index figures to bring valuations at different dates into line. The rateable value proxy is well suited to the cross-sectional nature of the present study.

From the lessons learnt through the evaluation of earlier research, this work has avoided the pitfalls that hampered those studies. The time horizon is appropriate to the problem and this is a key difference between this and most other studies. Another key difference is that, given that rateable value is a valid proxy for rents, the data were appropriate for testing the hypothesis, because they are related directly to the variables to which the theory directs our attention. The matched pairs are individual observations and so the approach is the equivalent of a fully specified hedonic

regression model for practical purposes and leaves only the main outcome variable of rent free to vary.

For the primary analysis in 1988 there are no obvious confounding market trends to handle: the 1973 property recession was a distant memory; the relaxation of planning use legislation in 1987 was considered too recent to have affected market values, and the prolonged recession that began in 1989 was not predicted or expected at the time of the cross-sectional study. Being an inter-jurisdictional study, these external facts are much less important, unless they vary across the borough boundary. They are significant because changes arising through other influences are likely to make the tax effect more difficult to isolate, and the parsimonious model adopted did not attempt to handle any of these variables explicitly.

This study employs the well established technique of using matched pairs. It demonstrates that there is a considerable research pay-off to basing the definition of relevant data explicitly and precisely in relevant theory and then investing substantial effort in collecting the data and cleaning the data-set meticulously.

## 9.3 SUMMARY AND DISCUSSION OF RESULTS

The empirical results set out in Chapter 8 present for the first time a complete set of results on the long-term impact of the property tax on industrial, retail and office property. The findings show that property tax differentials in the six London boroughs under study were shifted to rental values and thus capitalised into property values. This shifting effect was measured in 1988 and followed a prolonged period of high tax rate differentials, which was present in these areas from 1979 onwards.

The basic design was a Pre-test/Post-test design using cross-sectional data for the primary analysis. The results of the Pre-test analysis for all property types suggested that the properties were drawn from the same population in 1973 (Test 1 at 8.4.1).

The results of Post-test analysis included two separate tests of statistical significance on two outcome variables (rental value and total occupation costs) in 1988. The first was for the impact of tax rate divergence on the rental value (Test 2) and the second for equalisation of total occupation costs (Test 3).

Test 2 was a test of post-divergence impact on the rental value in 1988. It was expected that rents in each location would be different (see 8.4.2). This is one of the key tests for tax capitalisation: if the two sets of observations for rental value in 1988 can be shown to have been drawn from different sample populations after tax rates diverged, then it can be concluded that rents have adjusted to reflect the tax differentials.

Results of the test for post-divergence impact on rental values were found to have a statistical significance level of 5.7% for industrial property, a significance level of 8.3% for retail property, and a significance level of 5.1% for office property.

In statistical terms these results suggest that the extent to which property taxes are capitalised over time does not differ significantly from 100%.

Test 3 was the test of post-divergence equalisation of total occupation costs (defined as rent plus rate burden) in 1988. It was expected that total costs in each location would tend towards equalisation (see 8.4.3). This is another key test: if the two sets of observations for total occupation costs in 1988 can be shown to have been drawn from the same sample populations after rates diverged, then it can be concluded that total occupation costs have been equalised.

Results from all three property types for equalisation of total costs were not found to be statistically significant (as predicted), suggesting that the two sets of observations for each borough were drawn from the same population. The significance level for industrial property was 77%, for retail property 55% and for office property the level was 92%.

In statistical terms these results suggest that the total occupation costs have been equalised, thereby confirming the central research hypothesis of this thesis. Test 3 also specified a comparison of the total occupation costs in each borough. This analysis showed an average difference ranging from less than 1% in the case of office property rising to 2.8% for retail property, illustrating that total costs were equalised.

A secondary analysis extended the time frame of the empirical work to cover the period following the introduction of Uniform Business Rates, by testing for differential rental growth between boroughs between 1988 and 1998 (Test 4 at 8.8.1). These subsidiary findings suggest that the same conditions that led to the tax being capitalised by 1988 also resulted in differing rental value growth rates in the ten-year period following the introduction of Uniform Business Rates.

If the results from the six London boroughs can be generalised and the assumption of no differential tax benefits holds at the necessary geographic scale, it can be concluded that, over the longer term, it is likely that the full amount of the UK property tax is capitalised (through changes in rental value) and that the tax is borne by owners of property, both investors and owner occupiers, rather than leasehold occupiers.

The study undertaken for this thesis uses cross-sectional data for its primary empirical analysis, but it is nonetheless a study of the long-term impacts of the UK property tax. The results cover an overall period of 25 years and no other UK studies have been made on a similar time horizon.

There are two specific caveats that must be kept in mind when considering the results. The relatively small size of the paired data-sets for all property types in the cross-sectional study suggests the need for care in interpreting the statistical significance of the results, although the use of fully matched pairs should help to minimise this concern. The employment of a rental value proxy in place of actual lettings is also a potential concern that must be borne in mind when considering the findings though, as explained in Chapter 7, the use of this proxy was carefully verified before it was adopted and both the proxy itself and the results obtained were triangulated against letting market

data. One strong message that is plain from the empirical literature reviewed in Chapter 4 is the importance of having access to data at the appropriate level of detail and the difficulty of obtaining that data.

Cheshire and Mills (1999 at p. 1324) suggest one ' lesson for researchers about the very basics of good applied work: it derives from theoretical insight and a careful, even frugal, concern for data. Are these data appropriate for answering the questions that theory suggests are relevant?' While there may be some issues with respect to the data employed in this study, they do relate to the appropriate variables and great care has been taken to cross-check their validity as measures of those variables as well as eliminate sources of measurement error.

It was evident from the empirical literature that the model specification itself can play a central part in the results obtained when attempting to identify the extent of tax shifting (see 4.2).

The approach of this study has been to combine a meticulous approach to the data collection with a straightforward but robust statistical framework: the aim was to adopt a methodology that was simple but convincing and that combined a series of tests that help to increase confidence in the results. Whilst regression analysis was used when it was needed to analyse the longitudinal data in the pilot study, the model adopted for the primary analysis did not require the specification of a complex regression equation and no attempt was made to design a predictive model of tax capitalisation.

The choice of appropriate statistical significance level is a subject of considerable debate and a lengthy discussion could be pursued regarding the choice of a 10% level used to indicate statistical significance in this thesis (see 8.2). The convention of using a 1% or 5% level is, for many researchers, enshrined as the threshold value for declaring statistical significance. It is argued that this is too stringent for a problem of the type being studied in this thesis: ultimately, the choice of decision rule is arbitrary and this more demanding level from the natural sciences is often employed by social scientists without adequate reflection.

The results presented here are, of course, a product of time and place but they are not merely an observation of local conditions at one point in time. This study has taken deliberate advantage of a particular set of circumstances that have allowed the extent to which the tax is reflected in reduced rents to be identified. This work is properly related both to the theoretical and the empirical literature, takes careful account of previous research undertaken, and builds on the results of earlier studies. Whilst it is not suggested that the results obtained can simply be generalised and applied anywhere in the UK, they are considered to be indicative of the long-term impact of the UK property tax. The relatively inelastic supply in London for all three property types is thought to have played an important part in allowing the identification of long-term tax impacts and, given relative similarity in supply conditions, similar results would be expected elsewhere in the UK, subject to adjustment for appropriate differences in local conditions.

An important conclusion of this study relates to the crucial role played by the institutional setting, which dominates the way in which the expected tax impacts will operate. In the context of this study, where there are no benefit differentials, the tax is a deadweight payment and is fully capitalised through reduced rents. If the value of the benefits are equal to the tax payment, the value of the benefits will offset the payment, in which case there would be no change in rents (and if the value of the benefits is greater than the tax payment the benefits themselves may be capitalised resulting in increased rents).

The empirical results bear out the theoretical hypothesis of Fraser (1985) who postulated the complete abolition of the UK property tax. They build on the aggregate level empirical work which was considered in Chapter 4. Whilst it should be interpreted with care, this aggregate level research has shown that the incidence of the property tax in the UK is borne on capital in the short term and in particular on the owners of business. The micro-level study by Bennett and Fearnehough (1987) did not seek to identify the extent of property tax capitalisation, concentrating on the short-term impact of the tax, which was found to bear on capital in the form of reduced profits to business owners. These studies examined the first round effects of the tax and none of them attempted to identify any further impacts, partly because of

the nature of the data that were used, but also because of the time frame adopted by the authors. The time scale required for the analysis in the UK is necessarily long term because of the characteristics of the institutional lease and of the property market itself.

The findings in this thesis build on these earlier studies of short- and medium-term incidence, showing that, in the long term, the impact of the tax is shifted away from business occupiers and onto the owners of the property.

A more closely related strand of the literature has sought to identify the impact of the tax on property values in the UK. This began in 1989 with Sibley's study and ended with the work of Bond et al. in 1996, and this present work can be viewed as the concluding episode in this group of studies.

The findings presented here fill in the gaps in the previous results and this study addresses methodological flaws in relation to the data, the scale and the time frame of those earlier analyses.

The results for all three property types are the first such results in the UK for business properties over the long term. For industrial and retail, the data-sets are made up of secondary property, whereas the office data-set is made up of prime property. For industrial property there have been no published results from studies of tax impact in the UK. There have been two previous studies of retail property, one of which suggested weak short-term evidence of tax capitalisation for prime shops. For prime offices there has been one earlier study of tax impacts, which did not report statistically significant results.

For retail property, the results provide answers that eluded Crosby and Keogh (1990) in their study of shops in Nottingham. Typical of many prime city centre shopping areas, Nottingham is multi-centric and the authors found noteworthy results about the nature and importance of micro-location in a central shopping centre but there was a severe problem controlling for all the variables affecting the rents, to isolate the specific effect of the property tax. The use of matched pairs in the present study is considered to be a central

part of the methodology that helped to overcome and control for variations between individual properties.

This thesis extends the work of Bond et al. (1996a) who published statistically significant results for short-term tax impacts on prime retail property. However, the findings of their study, which was carried out at an aggregate level, are not convincing and they need to be treated with considerable caution (see 4.6.6).

Sibley (1989), working with office property in Westminster and Camden, found weak evidence of tax capitalisation. His data collection was careful and complete and was based on market evidence, but the model he employed was flawed. Sibley did not include any tests for statistical significance in his data analysis and he was also hampered by the recurring problem of a short time horizon (because of the way he specified his model).

This thesis takes Sibley's work in these two boroughs further, using his data for the pilot study and collecting further data that confirm in statistically significant terms that the tax is indeed capitalised in the circumstances that prevailed in the years leading up to 1988. Sibley's data covered the period 1983–85 and they were used in the pilot study (see 8.3) to triangulate the results of this work against market data.

The pilot study adopted the same methodology that was used for the primary cross-sectional analysis and this was augmented by a regression analysis that took account of the longitudinal nature of Sibley's data. The results of the pilot study, when compared to Sibley's own findings, illustrate the importance of both the research design and model specification to the successful analysis of tax impacts.

Comparison of results between the pilot study and the main analysis gives a further insight into how evidence of tax shifting becomes increasingly apparent over the longer time frame.

The results presented here for the outcome variable of rent in 1988 are strongest for office property and industrial property and weakest for retail

property. The strength of the results for office property is perhaps the least expected on theoretical grounds. There are several possible explanations for the strength of these results. It could simply be that the pairs for office property are better matched or that supply conditions differ in this market. The use of prime office property in Westminster/Camden could account for the difference. Although there is little empirical evidence to suggest that prime properties perform any differently from secondary properties per se, it is possible that secondary properties tend to be older and, due to depreciation (caused by obsolescence), they might experience slower rates of rental growth (see Baum 1991 at p. 60; or Fraser 1993 at p. 138).

Another possible explanation could be the quality of information that is utilised by occupiers in the prime office market. There is considerable evidence that occupiers of prime quality property normally rely on professional advice (see for example DOE 1995a). It is suggested that the superior advice available or sought by office occupiers may lead to more informed decision making, which could result in quicker adjustment. As early as 1983, market reports by one London agent identified high rates as an important component in total occupation costs for offices (Debenham Tewson & Chinnocks 1983).

The weaker results for retail property are understandable. Out of the types of business property considered here, the theory of rent as a surplus predicts the closest relationship for shops (the theory will be most valid for 100% prime pitches) but the nature of shop data gives rise to difficulties of analysis. This is primarily caused by the complications of micro-location within a shopping area (see Crosby and Keogh's 1990 study). The difficulty of accurately matching retail properties together could well have influenced the results because of the difficulties for the matching process of fully allowing for the nuances of micro-location in the shopping area. Whilst recognising this complexity, it is assumed that the pairings did adequately account for the principal aspects of retail location but there is simply more statistical noise in the data.

A further factor that may explain the relative weakness of the findings for retail property compared to the other two property types is that the tax rate

divergence emerged later in Barnet/Brent than in Enfield/Haringey and Westminster/Camden – this will have meant a shorter time scale for adjustment of rental values for retail property (see 5.7).

The difference in the significance of the results between office and industrial property is probably not statistically different (just over 0.5%). What is important is that this discussion of the disparity between results for the outcome variable of rent in 1988 be considered in conjunction with the results for total occupation costs in 1988, which for all three property types were found to be equalised.

A subsidiary finding of this research suggests that letting markets, at least in the areas studied, are efficient: indeed, equalisation of total costs requires the operation of the letting market to be efficient. This would perhaps be expected for the prime office property in Westminster/Camden, which is a key national UK office market and the availability of information has already been discussed above. Wheaton et al. (1997) discuss the process of search by tenants for space in the context of the central London office market. They relate it to a 'modern theory of search' in which market prices are the result of matching and bargaining between buyer and seller (Wheaton 1990). Others have tried to apply to property markets the efficient market hypothesis (EMH) from the world of finance (see for example Brown 1991 pp. 62–138; Brown and Matysiak 2000 pp. 431–462; or Wang 2000). For property this would be the weak version of the EMH, but the results presented here cannot be convincingly extended in support of this specialised theory. The chief conclusion from the present study on market efficiency is to confirm the theoretical insights of Evans (1995) who put forward the idea that property markets offer 'efficiency over time'. This work suggests that, in the long term, the discounted average annual expectation of future tax liabilities is reflected in the tenant's rental bid and to this extent the results do tend to confirm the long-run efficiency of the UK business property letting market.

In the context of market efficiency, it was possible that the changes introduced in 1990 would act to confound the research effort, especially if the market accurately reflected all available knowledge. This concern fails to take account of the delays in the operation of the property market and the

important policy decision to have an antecedent valuation date two years earlier than the date of the new rating list. Furthermore, the changes introduced by the new legislation were announced and implemented at comparatively short notice. Many believed that the consultation period was inadequate (Guy 1989) and some of the legislation was not in place even as late as January 1990 (DOE 1990). This meant that future expectations arising from this change were not reflected in the values used for the cross-sectional study, and the telephone survey of occupiers discussed in 6.3 confirmed that occupiers had little knowledge of the new system in November 1989, less than six months before it was introduced.

## 9.4 OF POLITICS AND POLICY

This positive economic study of tax impacts has purposely made little consideration of political and policy issues. It has been shown in this thesis that the UK property tax is not economically neutral, but property taxes remain relatively neutral compared to most other taxes, as witnessed by the popularity of the single-tax movement promoted by Henry George (1879). From the perspective of tax efficiency and equity, the government has addressed most of the criticisms that were levelled against business rates before the 1990 reforms and the UK property tax now better meets the equity criterion of fairness, in that owners of property in similar circumstances are treated equally.

Given that tax rates are uniform and that the tax is capitalised, it might be argued that the incidence of the tax is really neutral. This argument would be wrong: the tax capitalisation effects may, *ceteris paribus*, impact on all properties equally, but the tax burden still falls on property owners, introducing a potential distortion into the economy and allowing the burden to be shifted from tenants to property owners. It should be noted that the equalisation of the capitalisation effect will only arise after sufficient time has elapsed for the uniform tax to be reflected in rents. It also requires regular revaluations to be undertaken to ensure that ongoing inequalities do not arise through changes in the underlying tax base.

Tax capitalisation has an impact on holders of the affected asset at the time the capitalisation takes place. For property assets in the context of the UK property tax, this group of *losers* will be made up of many people because of the lengthy time scale for tax effects to have an impact. When the tax rate differentials existed, property owners in high rate areas were penalised but, following the introduction of uniform tax rates, these property owners will have benefited from improved property values. The tax-attributable differences in property values that existed before 1990 were expected to adjust away, as indicated by the reversal of rental growth rates between boroughs since that time (see 8.8.3). The *gainers* would be purchasers of property in a high rate area in 1990: they could expect to benefit over the following years from the introduction of Uniform Business Rates. A closely related point is that the (short-term) burden of business rates on occupiers will have no impact on tenants who take occupation after the rents have adjusted.

Now that business rates are uniform, the differential tax rates are clearly no longer of importance, but this does not mean that tax impacts are unimportant, because increases in tax rates are still expected to be transferred to property owners over time.

A more important problem is perhaps the need to keep the tax base up-to-date. The five-yearly pattern of revaluations that has been maintained since 1990 does help to address the repeated criticism of the irregular and delayed revaluations suffered by taxpayers under the old system. However, even with regular revaluations, there can still be considerable differences in rental growth between regions and these will be reflected at the revaluation, resulting in an ongoing process of capital value adjustments as local and regional property market trends are reflected in the periodic revaluations of the tax base. See IOD (1995 at p. 28) for a discussion of regional differences that occurred between the 1990 Revaluation and the 1995 Revaluation. The differences have been so marked in some cases that a three-yearly revaluation period has been recommended (RICS 1996 at p. 12) to prevent structural changes in property markets from distorting the even distribution of the tax impact. This problem will affect both the taxpayer in the short term and the property owner in the longer term.

It has been government policy to provide transitional relief (phasing of increases and decreases in tax burden) to occupiers for all revaluations since the Uniform Business Rate was implemented in 1990. Transitional relief is likely to even out the worst effects of periodic revaluations of the tax base, but it is only available to occupiers who meet certain pre-set criteria. Given that the short-term impact of changes in the tax burden have been shown to fall on the occupier, this means that the benefits of transitional relief are likely to be relatively well targeted, accruing to occupiers in the short term (Bond et al. 1996a at p. 30).

Two consequences follow from the transitional relief scheme as it is presently organised. First, the tax principle of certainty is compromised because of the complexity of the transitional relief scheme. The UK property tax has the advantage of simplicity and transparency, but this is eroded by elaborate transitional arrangements. A second more serious criticism is that the current transitional relief scheme compromises the principle of equity between taxpayers. The transitional relief scheme is designed to be self-funding over the life of each rating revaluation, with both increases and decreases in tax liability being phased (see A1.4). The consequence of this is that those taxpayers who would be entitled to a reduction in their tax liability (as a result of a tax base revaluation) are required to pay in excess of their correct tax payment, in order to fund the reduction for those who would otherwise have been faced with an increase. If it is government policy that increases should be phased in following a revaluation, these should be funded centrally to remove this inequality from the present system.

Today, business rates are a national tax collected by local authorities on behalf of central government. No answers are given about the effect this has on local democracy: it is another part of the ongoing centralisation of the past 50 years and Britain is now 'one of the most centralised democracies in the world' (Travers 2002). The benefits to business from local authority services are increasingly uniform as the trend of centralisation and central control has continued. Output measures, championed by the government since 1997, promote increased uniformity of local government services and this is likely

to further smooth any differential benefit effects between local authority areas.

A relatively minor criticism of the administration of the Uniform Business Rate is that tax demands sent to occupiers by local government do not make it plain that the tax is paid to central government and it is thought that many taxpayers do not appreciate that the role of the local authority is merely that of tax collector (RICS 1998 at para. 4.3).

One interesting and important finding from this study is that in the UK – or more strictly London – the evidence is consistent with there being no benefits specific to the local authority that are generated by property tax differences. This is probably a reflection of the institutional setting, where the focus of local authority policy has typically been on the residential sector of the local population and this problem has been exacerbated by the Uniform Business Rate. From the perspective of business input to local democracy, the position has rarely been worse: not only are local authorities funded from the centre but many of their actions are undertaken as agents for the centre. There is a lack of incentive for local authorities to encourage business development. The main impact is to eliminate the incentives for local authorities to grant planning permission or encourage local economic development because development now has no direct impact on local revenues.

Up until 1969, local business could vote in local elections and local business people could stand as local councillors. The Rates Act 1984 provided for consultation with business representatives when setting the rates, but this was abolished in the 1990 reforms. A recent Green Paper, *Modernising Local Government Finance*, suggested a possible role for business involvement in local decision making (DETR 1998), but these ideas have been criticised by the business lobby (see for example RICS 1998 at para. 4.4).

The 1998 Green Paper also suggested the reintroduction of limited local control over the level of the rates, but this was rejected by business, and research by the Institute of Fiscal Studies (Emmerson and Hall 1998 at p. 30) found that this proposal is likely to have the 'opposite effect' of restoring local accountability.

The most recent proposals in the development of local government finance are embodied in the Local Government Bill 2002/03 that was presented to the House of Lords in March 2003. These proposals are not considered in this thesis.

## 9.5 FUTURE RESEARCH

The results of this study indicate that future research on UK property tax impacts should generally take a long-term view; the short-term position is well established from the aggregate level studies and those short-term studies of the tax impact on property values have typically failed to provide the expected results.

This study has found evidence that is consistent with the tax being fully capitalised into rents but it is only an assumption that this rent reduction will be transmitted directly to a reduction in capital values. No account was taken of changes to investors' required yields (if any) that might result from the tax. This possibility was considered in 2.9 and, in view of the results of this present study, this is one area for future research. Much will depend on how efficiently the property *investment* market operates. Given the lengthy time period for tax adjustments to manifest themselves, investment yields may be expected to rise in the shorter term, to compensate purchasers for future falls that are expected to occur as a result of the tax. This is a complex issue, influenced by the gradual effect of tax shifting on the rent and the difficulty of anticipating how future trends in the local property market will affect the tax base. It would require a dynamic model of tax impacts (discussed later in this section) and data availability will be crucial in the success of any such research.

A related point concerns freehold owner occupiers. Baum and Crosby (1995 at p.15) observe that 'a distinction may be made between property owned for occupation (although there may be a simultaneous investment service performed by that property) and property owned for investment *per se*'. This particular group of occupiers is worthy of further discussion. The capital value of a business property is a reflection of the expected future income flows from that property. This capitalisation of income applies as much to

owner occupied property as it does to properties that are held as pure investments, and the same model of valuation is adopted. The market rental value of a property is the same regardless of the nature of the ownership interest (although the yield may perhaps differ for an owner occupied property) and the impact of the property tax in lowering rental values will affect the capital values of owner occupied property in just the same way as it affects freeholds that are held as an investment. On the other hand, it could be argued that the position of an owner occupier relative to a leasehold occupier puts the leaseholder at an advantage (through being able to shift the tax onto the owner). The way in which the property tax introduces distortions between pure investors, freehold owner occupiers and leasehold occupiers is another topic that could benefit from further research.

The shifting effect itself is dependent on a series of complex factors that vary between locations, including the value of differential tax benefits where they exist and the relative elasticities of supply and demand in each local property market. The results of this thesis are grounded in theory and they are indicative of the general case. Whilst it is possible to draw the conclusion that business rates are likely to be capitalised into property values, given sufficient time for the impact to work through to rents, it is not expected that this would be the same for all property types in every location at any time. Further research on the long-term impact of the UK property tax in other geographical areas would make a worthy extension to the analysis and would help to confirm the general applicability of the findings reported in this thesis.

This study presented results for both prime and secondary property, and the findings suggest that tax capitalisation takes place for both types of property. It is possible that rental growth rates for prime property are faster, due to more frequent refurbishment and correspondingly slower depreciation (of the buildings) and the results for prime office property discussed above perhaps suggest as much. It would be of great interest to carry out research to further illuminate the tax impacts between different classes of prime investment property.

The matched pairs approach limited the size of the data-set employed in the primary analysis, which did not permit a detailed evaluation of differences in capitalisation according to property-specific characteristics. With a larger data-set it would be possible to investigate the extent to which individual property characteristics might influence the extent of tax capitalisation. Such an analysis could take account of the impact of physical size, the effect of property value, as well as whether age, physical characteristics and planning class result in differences in the capitalisation effect.

The design and methodology adopted is considered to be reproducible and, given adequate resources, this would permit a wider study of property tax impacts. It would also allow the question of differing impacts in different regions to be investigated. As a part of any such work, it would be fruitful to explore the tax capitalisation effect for properties in locations with supply elasticities that differ from the London area, where supply is relatively inelastic. This is affected by the basic availability of land, as well as by the impact of planning policies. The way in which national and local planning policies impact on the speed and magnitude of tax capitalisation is another issue worth exploring.

Any research that sought to quantify the factors that affect the magnitude of the capitalisation effect would be of considerable interest and this could perhaps also take account of changes to investment yields arising from the tax (if any) discussed above. A long-term study using a dynamic model is perhaps the next logical development in this field. This could be used to explain the influence of different factors, using control variables and it may be possible to predict the magnitude of the tax impact in different circumstances. Development of an econometric model to take account of short-, medium- and long-term effects could also be considered and this might allow the speed of capitalisation to be identified or predicted. The latest developments in rent models (e.g. Hendershott et al. 2002) take no account of taxes in their analysis: the only dynamic model of tax capitalisation developed for business property in the UK was developed by Bond et al. (1996a). This model was based on short time series data and it failed to make any meaningful predictions. A hedonic approach is suggested as being most likely to give results but hedonic methodology has not been successfully applied to

business property in the UK and any such research would also have to overcome some intricate methodological difficulties. The chief obstacle to any such research would be the availability of suitable data.

In this study careful attention was given to any offsetting benefits received by taxpayers from local authority services. Previous research (Bennett and Krebs 1988) has found that benefit offsets do not occur for business in Britain and in this thesis it was assumed that, for the most part, benefits were equal between the local authority areas under study, and that any unequal benefits that did exist between local authorities were overwhelmed by the scale of the rate differentials that form the backdrop to this study. Whilst the benefit offset is not thought to be a major concern in the UK, at least in the context of taxes on business property, it remains an area for future research, especially under current conditions (of uniform tax rates), where attention could be paid both to benefit offsets of the tax in general and to differential benefits between local authority areas.

Another finding of general significance for future researchers in this field is that attention to the data is of prime importance. This has been a recurrent theme in this thesis and the importance is borne out by the careful approach to micro-level data collection and the corresponding results in this thesis, which for the first time show the long-term impact of the UK business property tax.

## 9.6 CONCLUSIONS

The results presented in this thesis add to the overall understanding of property tax capitalisation and the ways in which rents and therefore capital values adjust. This thesis provides strong support for the underlying hypothesis that, over time, property tax burdens are fully capitalised (in the absence of offsetting differentials in locally financed public services or public goods).

In even broader terms it has significant implications for the efficiency of property letting markets: it suggests they are closer to being efficient markets than some commentators or market operators have suggested, not in the sense of stock market efficiency proposed by Fama (1970), but more in the

way suspected by Evans (1995): a long-term efficiency that suggests rational decisions by market operators.

This research suggests that the UK property tax will be capitalised into business property values in the long term. The findings are applicable to properties in London and can perhaps be applied to similar property types in any of the major British conurbations. The extent of tax capitalisation will depend on the precise market conditions that apply and to the value of local benefits that might in principle be generated in return for the tax payment. Whilst this may result in significant variation in the short- to medium-term impacts of the property tax, in the long term it is suggested that rents will adjust to reflect the amount of the tax.

A corpus of work in the 1980s found that short-term tax impacts were on the firm and owners of capital, being borne in the form of reduced profits to shareholders. The results of this thesis complement that research by identifying the longer-term impacts of the tax as being shifted backwards again, onto owners of other capital in the form of property.

A small group of UK studies has attempted to identify the property impacts of business rates. This present work contributes to that body of research, adopting a long-term time frame that is appropriate to the problem, and obtaining answers where others have not found results. A tightly controlled methodology was applied to a rigorous and simple cross-sectional design: the results obtained are the reward for the care taken in data collection, problem definition and research design.

The findings in this thesis provide strong support for the underlying economic theory of rental value determination. It is apparent that rent is a residual, represented by the surplus left after allowing for all other costs, including owners' profit. They also confirm the predictions of neoclassical economic theory on the impact of a tax such as business rates: namely that the tax will be capitalised.

This research thus supports the predictions of theory and also confirms the widely held anecdotal view amongst property professionals about the impact

of the UK property tax. The fact that the tax is no longer levied at a differential rate is no reason to assume that the impact of the tax is no longer of importance, but these historic circumstances were used as an analytical device to provide empirical answers for the first time to the question of UK property tax incidence, originally posed by Alfred Marshall in 1890.

# APPENDIX 1

# BUSINESS RATES: THE LEGAL FRAMEWORK

## A1.1 INTRODUCTION

This appendix outlines the legal framework of UK property tax, providing an outline of how the rating system is implemented. Some of the more technical aspects of rating valuation are considered in Appendix 2.

After a brief history of rating in the UK, this appendix considers the operation of the system before 1990 and summarises the changes following the major reforms of 1990, which introduced Uniform Business Rates in England and Wales. No specific consideration is given to Scotland, where the Uniform Business Rate was introduced in 1995, or to Northern Ireland, where it has yet to be introduced.

For a comprehensive description of the structure of local government finance under the pre-1990 system see Hepworth (1984), or for technical coverage of rating valuation see *Bean and Lockwood's Rating and Valuation Practice* (Bassett et al. 1987).

The 1990 system is governed by the Local Government Finance Act 1988 and this is fully covered in *Ryde on Rating and the Council Tax*, the standard text on rating (Ryde and Roots 1990) and more concisely by Askham (1995).

## A1.2 HISTORICAL BACKGROUND

The emergence of rating as a form of local government finance dates back over 700 years, but the Poor Relief Act of 1601 marks the foundation of the modern national rating system. This Act provided for a local tax to be levied in every parish in the country at regular intervals. The list of those liable was comprehensive, including 'every inhabitant, parson, vicar, and ... every other occupier of land ... in the parish'.

The Act of 1601 did not set out the basis of assessment and for some time rates were assessed on both immovable and movable property, such as stock-in-trade. This absence of a statutory assessment basis was finally

addressed by The Parochial Assessment Act 1836, which, for the first time, set out a definite basis of assessment. It provided that rates were only valid if they were assessed on an estimate of the Net Annual Value of the property rated. Net Annual Value meant:

> the rent at which the property might reasonably be expected to be let from year to year, free from all usual tenant's rates and taxes, if any, and deducting therefrom the probable average annual cost of the repairs, insurance and other expenses, if any, necessary to maintain [it] in a state to command such rent.

Rating of movable property stopped soon afterwards with the Poor Rate Exemption Act of 1840, since when rates in the UK have applied only to immovable property.

This early legislation established the most distinctive features of the rating system as it applied until the major reforms of 1990, namely that it was a local tax on occupiers based on the rental value of the property.

## A1.3 THE RATING SYSTEM BEFORE 1990

Until 1990 the property tax was called the General Rate in England and Wales and it was governed by The General Rate Act 1967, as amended by the Local Government Act 1972 and supported by a large body of case law.

It is not intended to go into any depth in considering the administration of the tax here, but basic principles are set out in so far as they affect the subject matter of this thesis. This section is based on *Principles & Practice of Rating Valuation* (Emeny and Wilks 1984), which provides wide-ranging coverage of the Rating System before 1990.

### A1.3.1 TAX BASE

The *rateable value* of a property was the basis against which the rates payable were calculated and the rateable value of all properties was set out in the valuation list (General Rate Act 1967 Part V).

Each property in a rating area had a rateable value that was equal to its net annual value (General Rate Act 1967 s. 19). Properties were either assessed to *gross annual value* or to *net annual value* for rating purposes. Gross annual value assumed that the landlord was responsible for repair, maintenance and insurance; a statutory deduction was applied to arrive at the net annual value. The net annual value is assessed by reference to the annual rental value of the property under a hypothetical tenancy, which is examined in more detail in A2.4.

The Rating & Valuation Act 1925 provided for a new valuation list to be prepared every five years, a process referred to as the *quinquennial revaluation.* This process was not accorded a high importance and new valuation lists came into force in 1933–4, 1956, 1963 and 1973. The infrequency of valuations caused criticism of the rating system (discussed at 5.3) and gave rise to inequities due to changing property values not being reflected adequately in the tax base (Cunnane and Walker 1989).

Since February 1950, the preparation of each valuation list in England and Wales was in the hands of a valuation officer, who is an official of the Inland Revenue, and is known as the *District Valuer.* The role of maintaining rating lists is today handled by the Valuation Office Agency which is an executive agency of the Inland Revenue (since September 1991). The whole of England and Wales is divided into Districts with a District Valuer in charge of each and a Chief Valuer in overall charge of the Valuation Office.

Given the long periods that passed between rating revaluations, there were many cases where the valuation list needed to be altered between revaluations. There were special provisions in the legislation to ensure that the value entered in the list following an alteration reflected the general level of values that applied when the list was made. This is referred to as the *tone of the list* (General Rate Act 1967 s. 20, as amended).

In addition, the valuation officer had the power to require a 'return' from the property owner, occupier or lessee, containing information about the rent or any other particulars that might be required by the valuation officer to assess the rateable value for an entry in the valuation list (General Rate Act 1967 s. 82). Rent return forms were sent to most occupiers in preparation for the 1990 Revaluation.

## A1.3.2 TAX RATE

Up to April 1990, the tax rate was determined by the local rating authority (General Rate Act 1967 Part I) and the principle that the rating authority was responsible for setting the tax rate went back to the Poor Relief Act of 1601.

The annual tax rate was expressed in pence per pound of rateable value which was known as the *rate poundage*, e.g. 70p or 130p (in the £). This represented the tax rate that was levied against ratepayers, based on the rateable value of the property they occupied as shown in the valuation list.

> *If the rate poundage is 70 pence in the pound and the rateable value of a property is £5,000, then the rates (tax) payable will be £3,500 for the year.*

In setting the tax rate the rating authority decided on the total revenue to be raised in the year, having regard to its planned expenditures. The amount of the rate poundage was found by dividing the sum to be raised by the aggregate rateable value for the area. The same system applied to both domestic and non-domestic rates and it was common for there to be a higher tax rate for non-domestic rates.

> *If the local authority wishes to raise £12 million and the total rateable value of all properties in its area is £24 million then a rate of 50 pence in the pound would be levied.*

## A1.3.3 RATEABLE OCCUPATION

The tax was payable by a *rateable occupier* and strictly speaking it was the occupier who was rated, not the land; the occupier was taxed in respect of

the land he occupied (General Rate Act 1967 Part III and supporting case law). There is no need to examine here the intricacies of what constitutes rateable occupation.

For many years empty premises were not rated, although they still benefited from local services, such as police and fire service. The Local Government Act 1966 introduced a power to allow local authorities the discretion to charge an *unoccupied rate,* which many local authorities implemented as a reduced charge on empty buildings. This was bolstered by a mandatory *rating surcharge* on unoccupied business property, introduced in the Local Government Act 1974 as a stepped penalty surcharge designed to discourage property developers, especially in central London, from leaving buildings unlet.

### A1.3.4 RATING AUTHORITIES

Inside Greater London, the rating authorities were the 32 London boroughs plus the City of London and a few anomalous authorities such as the Inner and Middle Temple. These arrangements for London were in place from 1965. Outside London, the rating authorities were the metropolitan and non-metropolitan district councils, although the competent rating authority in any particular area may have changed over time with successive local government reorganisations.

The income from rates must be spent on the provision of local services but only local authorities defined as rating authorities had the right to set and collect rates, and this generally meant district councils outside London.

County councils (and some other public bodies) also provided local services, but they had no power to set or collect rates. They obtained their local funding by issuing a 'precept' on the local authority (General Rate Act 1967 Part II). This was known as the county precept and the rating authority then had to increase the general rate by the amount of the precept. In London, precepting powers were held by the GLC until it was abolished, when they passed to the London Residuary Body. The extant regional authority in

London levied its precept on all London boroughs. Additional precepts were levied by the Metropolitan Police and also on the 13 inner London boroughs by the Inner London Education Authority (ILEA). In 1990 the ILEA was abolished and responsibility for education passed back to the local authorities concerned.

Other precepts that were commonly charged with the local authority rates included water and sewerage charges, before privatisation of the water industry in September 1989.

Rating Authorities were able to levy a supplementary rate at any time, depending on the needs of their area, or if required to meet any precept.

## A1.4 LOCAL GOVERNMENT FINANCE AFTER 1990

The Local Government Finance Act (1988) introduced the most comprehensive change to local taxation in England and Wales for over 70 years, but in many particulars the system outlined above remained intact and much of the case law that had built up over the years remained valid.

There were three main changes to the rating system outlined above, with effect from April 1990.

1. The first revaluation in England and Wales for 17 years. The last revaluation was in 1973.

   The new system provided for a valuation date two years earlier than the date of the rating list itself. The 1990 Rating List, which came into force in April 1990, is based rental value in April 1988. The valuation date is considered in A2.5.

2. The introduction of the Uniform Business Rate to replace individual rate poundages set by local rating authorities. There are now separate Uniform Business Rate multipliers in place for England, Wales and Scotland.

   Rate capping and other powers taken by central government in the 1980s had introduced some controls on local government tax rates

but, for the first time, the tax rate itself was to be set by central government. The Uniform Business Rate was still to be collected by local authorities but it was then gathered into a national pool and redistributed back to local authorities in proportion to their population.

3. Abolition of domestic rates and the introduction of the Community Charge in their place. This was introduced in Scotland one year earlier.

   The community charge was a poll tax, payable by all adults, at a level set by the local authority and having no element of property value as its basis. This tax was quickly abandoned and it was replaced in April 1993 with the present system of a Council Tax, which is chiefly a property tax based on the capital value of domestic property but which includes a personal element.

The impact of the new system on taxpayers was recognised as likely to cause some redistributional effects, exacerbated by the long period that had elapsed since the 1973 Valuation List. To counter the worst effects of this problem, the government introduced a system of transitional relief, designed to postpone some of the largest increases in tax liability by phasing the introduction of the new system. Increases in tax liability were phased over five years and reductions in tax liability were also phased, so that the transitional relief system was designed to be self-financing.

In addition to the major changes listed above, the new system was a chance to introduce other changes and improvements to the day-to-day operation of the rating system.

Under the Local Government Finance Act 1988, the definition of rateable value was redefined. The distinction between gross annual value and net annual value was removed and rateable value was adopted as the rating definition for all classes of business property. The definition of rateable value in the 1988 legislation is key to this thesis, because the rental proxy for April 1988 is based on the rateable value that is so defined. The statutory definition of rateable value and the hypothetical tenancy that follows is examined in Appendix 2 where the pre-1990 definition is also compared: the 1973 rental proxy is dependent on the earlier definition.

The term 'valuation list' was replaced by the term 'rating list', and a *central rating list* was introduced. Under s. 52 of the 1988 Act there are some properties that get entered into a central rating list. This includes the rateable values of properties that span the country, typically railways, and other types of former statutory undertakings (Plimmer 1998 at p. 123).

Collection of rates under the new system was still by local authorities but they now took the role of billing authorities (not rating authorities).

A number of other changes took place to the detailed operation of the system, including amendments to a number of established rating terms, such as 'tone of the list' and use of the term 'composite' instead of 'mixed' for premises that include both business and residential property, e.g. a shop with a flat above (Askham and Mackmin 1995 at p. 6).

# APPENDIX 2

# RENTAL VALUE AND THE HYPOTHETICAL TENANCY

## A2.1 INTRODUCTION

In this appendix there is a discussion of the difference between rental value set in the market place and a rental valuation prepared by a valuer. This is relevant because the availability of transaction data from the market place is scarce and this study relies on a rental proxy that is based on a valuation opinion of market rental value. Open market transactions are not always comparable and consideration is given to the difficulties of analysing this evidence for use in rental valuations.

Finally, the terms of the hypothetical tenancy used in rating valuation are reviewed and the date of valuation is considered. This discussion complements the overview of the UK rating system that is set out in Appendix 1.

## A2.2 RENTAL VALUE VERSUS PRICE

Rent in the property market is the price paid for the occupation of a property. This price is set in the letting market by the forces of demand and supply, and the economic determination of rental value was examined in Chapter 2.

Compared with price, a rental valuation represents an opinion by a valuer of the price (rent) at which a property might let and any such opinion is based on a series of assumptions, as well as an analysis of comparable evidence from similar transactions that have taken place.

Today there are published definitions of rental value available, the latest being set out in the *RICS Appraisal and Valuation Standards* (2003): these are technical definitions designed to meet specific needs of asset valuations for use by pension funds, company balance sheets, banks and the like. These definitions do not need to be considered further here.

The essential question within this current work is whether rental valuations can act as a good proxy for prices. The whole question of valuations versus

transaction evidence is a much debated topic in the valuation literature and Dunse et al. (1998) comment that 'there is now an extensive literature on the accuracy of valuations'.

One such debate took place in the mid 1980s when Hager and Lord (1985) published a high-profile paper criticising the valuation profession. In a reply to this criticism, Brown (1985) considered 'valuations versus prices' and he presented strong evidence that market valuations can be a good proxy for prices. This is discussed further in Brown (1991 pp. 241–245). Whilst Brown was considering capital values, this necessarily included rental values and there is no reason to suppose that his findings would not hold true for rental valuations.

A comparison of market rents with the rental value proxy used in this thesis is set out in 7.2.2.

## A2.3 ANALYSIS OF COMPARABLES

Crosby and Murdoch (2000) analyse the influence of procedure on rent determination and they conclude that the best comparable evidence is from transactions that took place in the open market.

There are a number of issues that make the analysis of open market lettings complicated and this in turn means that the use of comparable evidence when making a valuation can be difficult (even though it is essential). The chief difficulty is that each lease contract will be different, making the standardisation of market lettings problematic.

In the first place it is necessary to have a full breakdown of the lease terms and this must cover the rent review pattern, the basis of rent review, the permitted users under the lease, the repairing covenants, details of any option for the tenant to break the lease, details of any premium paid, details of any rent free period and any other relevant information that would have influenced the tenant when making a rental bid. It is not always possible to get such a detailed breakdown of the lease terms, either due to lack of

knowledge of market transactions or, in some cases, through confidentiality agreements between landlord and tenant.

The use of rateable values as a rental value proxy removes from this work the difficulty of analysing comparables: the problem falls to the local valuation office, who must make the necessary adjustments to get rents onto a comparable basis for use in the valuation or rating list. Rating valuers refer to this process of analysis as 'devaluation'.

## A2.4 HYPOTHETICAL TENANCY

In Chapter 7 the matching criteria that were used to match properties into pairs from a physical and locational perspective were described. This matching exercise would be meaningless if the legal aspects were not also carefully matched. Crosby (1985b at p. 19) commented on this in the following terms 'The property with identical locational and physical characteristics is not enough. The lease structure must also be identical.'

In this thesis, the difficulty of getting sufficient *comparable* transaction data was considered to be too great and that is why the rental proxy was adopted. It has the advantage of allowing a standard set of assumptions to be made about lease terms, thereby solving the problem of legal comparability. This is achieved by the use of a hypothetical tenancy, which, in the case of the rental proxy adopted here, is a well-established principle from rating law and practice.

This approach has established precedents. Baum (1989 at p. 79) uses a 'panel of three surveyors familiar with the study area ... to produce a consensus view of the current rental value' and this valuation opinion is based on a hypothetical tenancy that Baum adopts to standardise the data for letting market anomalies that would arise from real market data.

Rateable values represent a rental valuation at a given date and they are carried out on the following statutory assumptions:

> The rateable value of a non-domestic hereditament shall be taken to be an amount equal to the rent at which it is estimated the hereditament might reasonably be expected to let from year to year if the tenant undertook to pay all usual tenant's rates and taxes and to bear the cost of the repairs and insurance and other expenses (if any) necessary to maintain the hereditament in a state to command that rent (Local Government Finance Act 1988 Schedule 6 (2)).

This definition was used to set rateable values in the 1990 Rating List, which are used as the proxy for the outcome variable of rent in 1988.

Rateable values from the 1973 Valuation List were used as the proxy for 1973 rental value and the definition of rateable value above is almost the same as the definition used in the 1973 Valuation List under the General Rate Act 1967 (s. 19) where it was called net annual value.

Under the 1988 legislation, all properties are valued to rateable value, which means that the outcome variable of rental value in 1988 is estimated on the assumption of a full repairing and insuring lease, whereas in previous legislation properties could be valued either to gross annual value or to net annual value. Gross annual value assumes that the landlord is responsible for repairs and insurance and there is a statutory deduction to arrive at the rateable value. When dealing with the 1973 rental values, the net annual value from the 1973 Valuation List is used.

This 1988 definition of rateable value was amended by the Rating (Valuation) Act 1999 but it remained substantially the same and no account was taken of this recent amendment when making the analysis of rental growth in 8.8.

The statutory definition of the term rateable value has given rise to a hypothetical tenancy, which also implies a hypothetical landlord and hypothetical tenant. While these terms are not defined in the legislation, they have been the subject of considerable litigation over a period of 140 years that has defined their precise meaning (Ryde and Roots 1990 at p. 162).

Hereditament in rating is an archaic term, simply meaning the 'property that may become liable to a rate' being that part of the property that would be shown separately in the valuation list (General Rate Act 1967 s. 115). It is worth mentioning that, whilst there is a range of assumptions about the hypothetical tenancy, the hereditament is not hypothetical. It is to be valued as it stands with all of its advantages and disadvantages. This supports the use of matching criteria based on the physical characteristics of the property.

The rent to be estimated is such rent as might reasonably be expected for the hereditament if 'let from year to year', but this is not to suggest that it is let on a yearly tenancy. This is taken to mean a letting with a 'reasonable prospect of continuance' (Bond and Brown 2002 at p. 70) and it has been settled in the courts that, for business premises, this is akin to a tenancy under the Landlord and Tenant Act 1954 Part II.

It is important to note that the rent being assessed is an annual rent and the hereditament is assumed to be vacant and to let (Emeny and Wilks 1984 at p. 146).

The hypothetical tenant is 'assumed to inspect the hereditament at the date of valuation and having made reasonable enquiries as to the property, locality etc., to make a rental bid at that time' (Plimmer 1998 at p. 68).

The tenant is assumed to be responsible for repairs and the hereditament is also assumed to be in a reasonable state of repair at the commencement of the hypothetical tenancy. According to Bond and Brown (2002 at p. 74) this standard of repair is taken to mean 'the general state of repair of a particular class of property in a particular locality'.

The statutory definition refers to 'tenant's rates and taxes'. In the past there may have been others, but business rates will now 'be the most significant and normally the only tax' falling within this phrase (Ryde and Roots 1990 at p. 184). The tenant's responsibility for the payment of business rates within the valuation definition is in line with the theory of rent as a residual, which was explained in 2.6. Perhaps more importantly, this provision has the effect

of making rateable value equivalent to a rent exclusive of rates, which is necessary for the purpose of the rental proxy in this thesis.

The assumption of hypothetical parties to the tenancy means that the actual occupier must be disregarded, for example, if the building is owner occupied, but it should be noted that physical use of the hereditament (in actual or planning terms) must be taken into account (Bassett et al. 1987). Any part of a hereditament that is used for a 'wholly different purpose and ... is capable of separate occupation ... will form a separate hereditament' (Bond and Brown 2002).

Special problems arise under the 1990 system when it comes to composite hereditaments, which are defined as 'composite if part ... consists of domestic property' (Local Government Finance Act 1988 s. 64(9)). This is particularly common in relation to shops with residential accommodation above and composite hereditaments were excluded from the matched pairs used for the empirical work in this thesis.

For this particular study there is a further class of hereditament that was encountered more frequently than normal and that is the *cross-boundary property.* Prior to 1990, each local authority levied its own rate, at a rate poundage of its own choosing and, if a hereditament straddled the boundary of a rating area, it was treated as two or more hereditaments. With the introduction of the Uniform Business Rate it was decided that these artificial hereditaments could be abolished (see Bond and Brown 2002 at p. 28). The Non Domestic Rating (Miscellaneous Provisions) Regulations 1989 provided that cross-boundary properties should be treated as one hereditament and as being situated in the area of only one billing authority for the duration of the rating list. This change in treatment to cross-boundary properties during the time frame of the empirical study meant that they were excluded from the matching process.

This set of assumptions relating to the hypothetical tenancy can be considered as equivalent to a letting of a property in the open market on a modern lease. It follows that the rateable value can be viewed as a good

proxy for rental value (see also 7.2) and the proxy should therefore allow the impact of rate burden to be examined and explained.

## A2.5 VALUATION DATES

The date that the 1973 Valuation List came into effect and the date of valuation for that list was the same. Preparation of a new valuation or rating list takes place in advance of the date that the list comes into effect. The Valuation Office had to anticipate rental values in advance of the 1973 Valuation List, and in a time of changing market circumstances, this was difficult.

For the 1990 Revaluation and for subsequent revaluations, the date of valuation is set at an antecedent date, giving time for the collection and analysis of evidence prior to the introduction of the list. For the 1990 Rating List, the antecedent date was April 1988, for the 1995 List it was April 1993 and for the 2000 List it was April 1998.

The antecedent valuation date is the date that is used for setting the level of values, or the 'tone of the list'. However, the hereditaments to be valued must be valued as they were at the date of the list itself. For the 1990 Rating List, this means that the property is valued as it stood at April 1990 but according the level of values in April 1988.

This idea of valuing the property as it stands is a cornerstone of rating practice, represented by the maxim *rebus sic stantibus.* The hereditament is to be valued as it actually stands, subject to the hypothetical tenancy. This includes the actual use of the hereditament, as well as the 'mode or category' of occupation, which means that a 'shop is valued as a shop, but not a specific type of shop' (Askham and Mackmin 1995 at p. 22).

For the properties used in the main analysis, it was important to match as far as possible the extent of the hereditament entered in the rating list with the physical premises during the field survey. For office and industrial property this was not straightforward: it was not always possible to ascertain the

precise extent of the rateable hereditament, in which case the property was excluded from the matching process.

It was also necessary to have information about the state of repair, the user and any alterations since the date of the rating list, especially if this resulted in a change of floor areas. This information needed to be taken into account when matching properties together and to ensure comparability between the rental proxies in 1973 and in 1988. In practice this meant that properties that were altered substantially between April 1990 and the date of field survey were excluded.

The values taken from the valuation list were not constantly updated, to reflect the current state of rating appeals. The values were taken from the valuation or rating list as it stood on the date when the list was consulted and they were not subsequently reviewed. Some of the entries may have been altered at that time, and others could have been in the process of alteration. This applies to rateable values from all four lists consulted for this thesis (the 1973 Valuation List and the 1990, 1995, and 2000 Rating Lists).

# APPENDIX 3

# GEARING EFFECT OF COST INCREASES

## A3.1 GEARING EFFECT OF COST INCREASES

This appendix illustrates the gearing effect of increased costs, showing the volatility of the residual as costs change. Tenants' target profits are included in the figure for costs and the residual shown here is representing the rent available to the landlord.

Table A3.1 shows the impact on the residual rent in the circumstances of rising incomes matched by a similar rise in costs. Table A3.2 shows the impact on the rent in the circumstances of costs rising faster than incomes.

**Table A3.1: Gearing Effect for Equal Rates of Increase**

Income and Costs each rise by 20%

| | Year 1 | Year 2 | Year 3 | Year 4 |
|---|---|---|---|---|
| Income | £100,000 | £120,000 | £144,000 | £172,800 |
| Costs | £80,000 | £96,000 | £115,200 | £138,240 |
| Residual (Rent) | £20,000 | £24,000 | £28,800 | £34,560 |
| Residual Growth Rate | - | 20% | 20% | 20% |

Table A3.1 assumes that both revenue and costs increase each year by 20%. In this situation rental growth takes place at the same annual rate.

**Table A3.2: Gearing Effect for Differing Rates of Increase**

Income rises by 20% and Costs rise by 22.5%

| | Year 1 | Year 2 | Year 3 | Year 4 |
|---|---|---|---|---|
| Income | £100,000 | £120,000 | £144,000 | £172,800 |
| Costs | £80,000 | £98,000 | £120,050 | £147,061 |
| Residual (Rent) | £20,000 | £22,000 | £23,950 | £25,739 |
| Residual Growth Rate | - | 10% | 8.86% | 7.47% |

In Table A3.2, income growth is maintained each year at 20%, but costs increase at a slightly higher annual rate of 22.5%. This results in a marked fall in the rate of rental growth each year, although rent does still increase.

# APPENDIX 4

# EMPIRICAL EVIDENCE FOR RESIDENTIAL PROPERTY

## A4.1 INTRODUCTION

The studies set out in this appendix cover residential property in both the UK and North America. They are classified in accordance with the principles set out in 4.3.

Four studies (Orr 1968; Heinberg and Oates 1970; Hyman and Pasour 1973; Dusansky et al. 1981) differ markedly from the rest in that they deal with residential rents in the US and these are not considered here.

## A4.2 AGGREGATE LEVEL RESIDENTIAL STUDIES

These studies have been carried out using the Tiebout-Oates model (see 4.2.1) and the majority of these studies were made before 1985, when modelling methods were still in their infancy.

Aggregate level studies have met with mixed results. Most have tended to confirm the hypothesis that the property tax is to some extent capitalised, with the majority finding capitalisation rates of between 50% and 100% (see for example Oates 1973; Edel and Sclar 1974; Meadows 1976; King 1977; Rosen and Fulleton 1977 ; Goodman 1983). Then again, Gronberg (1979), in a study of Chicago, finds the opposite to be true and identifies no capitalisation effect.

UK literature for residential property during this productive period is notable for its absence. Aggregate level studies in the UK at that time were focused on the issue of fiscal migration. Aronson (1974), using Leeds and Manchester, concentrated on the identification of any household relocation that might arise from high differential tax rates. Davies (1982) did the same for Greater London, basing his work on the model developed by Aronson.

As more knowledge was gained by researchers, and particularly following the definitive analysis by Yinger et al. (1988), the trend has been to adopt micro-level data rather than aggregate level data for tax incidence studies.

Few recent aggregate level studies have been undertaken. In 1991 Linneman and Voith (1991) employed Annual Housing Survey Data to estimate the housing price functions. Based in Philadelphia in 1982, Linneman found a mean annual capitalisation rate of 10%.

A less typical approach was adopted by Wassmer (1993) who examines 62 US cities, using national statistics to test the new view of the property tax. He concludes that 'local property taxes affect local property values in the manner predicted by the new view'.

## A4.3 MICRO-LEVEL RESIDENTIAL STUDIES

Just like the aggregate level studies, this part of the literature has largely been carried out in a Tiebout-Oates framework.

Tax capitalisation is found by most studies in this group, ranging from 30% up to full capitalisation (see as examples King 1973; Edelstein 1974; Hamilton 1979). In two cases over-capitalisation of the tax was found (Church 1974; Noto 1976), both of which were studies in California. And again some studies find no capitalisation effect, for example Wales and Wiens (1974) in Vancouver and Chinloy (1978) whose work is also in Canada. This is at least partly explained by the different tax regime in Canada where tax credits mitigate the capitalisation effect.

More recent micro-level studies have confirmed the general picture, that the property tax is capitalised, with work by Eisenberg (1996) in Syracuse finding 100% capitalisation and Palmon and Smith (1998b) in Houston finding 62% capitalisation. Bartolomé and Rosenthal (1999) adopt a different approach, attempting to take into account the federal income tax position of home owners and finding 40% capitalisation.

In the UK, there are again notably fewer studies. A study by Topham and Ward (1992) used hedonic price estimation to identify the degree of tax capitalisation for residential property in Manchester. This study used a large data-set containing over 5,000 properties and it adopted the ACORN classification for residential neighbourhoods (CACI Market Analysis 1988). The approach was successful, finding that, for Greater Manchester in 1985–

6, even a small increase in effective tax rates resulted in a reduction in the expected value of residential housing.

Lately there have been studies of the Council Tax impacts in Britain (see for example Bancroft 1995), but these are not considered in this review of the property tax literature.

## A4.4 RESIDENTIAL TAX RATE CHANGE STUDIES

There are six residential tax change studies in the US and the empirical work in this thesis falls into this category of study.

Wicks, et al. (1968) and Smith (1970) each study jurisdiction-wide tax base revaluations, to see if the resulting changes in tax payments allow the capitalisation effects to be studied. Both studies found that capitalisation does take place. The Wicks study took data in one county in Montana, which had a county-wide reassessment of the tax base in 1965. For the sample data, which consisted of property sales subsequent to the November 1965 tax base revaluation, the following variables were recorded: 1965 taxes, 1964 taxes, the sale value and the assessed value. Smith used a similar set of circumstances in San Francisco, where property owners were faced with a revaluation in November 1967 and he took his data from 'a relatively homogenous section of San Francisco, after a street by street examination'.

Gabriel (1981) and Rosen (1982) both take California's famous Proposition 13, the Jarvis-Gann initiative, as the tax change that allows them to study the tax capitalisation effect. Proposition 13, the first of several 'popular' revolts against tax levels, was a voter-led initiative that resulted in large property tax changes. Both studies use individual house prices and both identify tax capitalisation. Rosen states:

> the results of this study provide the strongest confirmation yet of interjurisdictional capitalization described by Oates. Each dollar decrease in relative property taxes appears to increase relative property values.

In a comprehensive investigation, Yinger et al. (1988) examine intra-jurisdictional tax capitalisation in seven Massachusetts communities. Taking data on individual houses that sold twice, once before and once after a court mandated tax base revaluation, they find strong evidence of tax capitalisation. The study takes account of numerous housing and neighbourhood characteristics, and even controls for anticipated tax capitalisation on sales that occur after the revaluation is announced, but before it has been carried out.

Do and Sirmans (1994), in San Diego, exploit an unusual infrastructure financing technique available in California as a result of Proposition 13. Known as Mello-Roos Infrastructure Financing, it requires houses in new developments to pay for any added infrastructure costs they impose. This allowed the authors to estimate the inter-jurisdictional tax capitalisation by comparing new houses with those in established neighbouring communities. They find that property tax capitalisation is complete over a 25 year time horizon, which is the duration of the added infrastructure fee on the new houses.

A related strand of the literature concerns impact fees, which are increasingly used in the US as an alternative to property taxes. Unlike the infrastructure fees investigated by Do and Sirmans, which were charged to home owners and amortised over time, impact fees are a capital charge to the property developer for the provision of local government infrastructure. They are closely related to planning agreements used in the UK by Local Planning Authorities (Town & Country Planning Act 1990, s. 106) which are discussed by Evans (1999 at p. 1653). An emerging literature in the US examines the economic incidence of impact fees – who actually bears the burden of the fees – a topic that is obviously close to the questions examined in this thesis. Impact fees and planning agreements are not considered further here, but papers by Ihlanfeldt and Shaughnessy (2002) and Baden and Coursey (2002) represents the current state of the art.

## A4.5 CONCLUSIONS

With the few notable exceptions (Wales and Wiens 1974; Chinloy 1978; Gronberg 1979), all residential studies find statistical evidence of capitalisation, in spite of some severe data limitations and numerous methodological problems. These problems may explain in part the large variation in the extent of property tax capitalisation reported from study to study. Palmon and Smith (1998b) observe that 'the estimates of property tax capitalization have not converged to a consensus rate'. This statement reveals a fairly common idea in much of the US literature, namely that it is possible to identify some universal tax capitalisation rate. This is not seen as a realistic or attainable goal given the complex influences that affect the process of property tax capitalisation: Trussler (1982) observes (at p. 262) that 'in incidence analysis, the number of factors to be considered is so formidable that no single study is ever likely to provide definitive answers to empirical questions'.

# APPENDIX 5

# RESULTS OF LOCAL GOVERNMENT ELECTIONS

**Table A5.1: Results of Local Government Elections**

London Borough of Enfield

| Election Date | CON | LAB | LD | OTH | TOTAL |
|---|---|---|---|---|---|
| *02.05.02* | *39* | *24* | *-* | *-* | *63* |
| *07.05.98* | *23* | *43* | *-* | *-* | *66* |
| *05.05.94* | *25* | *41* | *-* | *-* | *66* |
| *03.05.90* | *34* | *32* | *-* | *-* | *66* |
| *08.05.86* | *38* | *28* | *-* | *-* | *66* |
| *06.05.82* | *47* | *19* | *-* | *-* | *60* |
| *04.05.78* | *41* | *19* | *-* | *-* | *60* |
| *04.05.74* | *30* | *29* | *1* | *-* | *60* |
| *13.05.71* | *32* | *28* | *-* | *-* | *60* |
| *09.05.68* | *51* | *9* | *-* | *-* | *60* |
| *07.05.64* | *29* | *31* | *-* | *-* | *60* |

*Source: London Borough Council Elections (Minors and Grenham 1998), Updated with local election results.*

**Table A5.2: Results of Local Government Elections**

London Borough of Haringey

| Election Date | CON | LAB | LD | OTH | TOTAL |
|---|---|---|---|---|---|
| *02.05.02* | *-* | *42* | *15* | *-* | *57* |
| *07.05.98* | *2* | *54* | *3* | *-* | *59* |
| *05.05.94* | *2* | *57* | *-* | *-* | *59* |
| *03.05.90* | *17* | *42* | *-* | *-* | *59* |
| *08.05.86* | *16* | *42* | *1* | *-* | *59* |
| *06.05.82* | *22* | *33* | *-* | *4* | *59* |
| *04.05.78* | *17* | *42* | *-* | *-* | *59* |
| *04.05.74* | *19* | *40* | *-* | *1* | *60* |
| *13.05.71* | *19* | *41* | *-* | *-* | *60* |
| *09.05.68* | *53* | *7* | *-* | *-* | *60* |
| *07.05.64* | *19* | *41* | *-* | *-* | *60* |

*Source: London Borough Council Elections (Minors and Grenham 1998), Updated with local election results.*

**Table A5.3: Results of Local Government Elections**

London Borough of Barnet

| Election Date | CON | LAB | LD | OTH | TOTAL |
|---|---|---|---|---|---|
| *02.05.02* | *33* | *24* | *6* | *-* | *63* |
| *07.05.98* | *28* | *26* | *6* | *-* | *60* |
| *05.05.94* | *29* | *25* | *6* | *-* | *60* |
| *03.05.90* | *39* | *18* | *3* | *-* | *60* |
| *08.05.86* | *39* | *18* | *3* | *-* | *60* |
| *06.05.82* | *48* | *12* | *-* | *-* | *60* |
| *04.05.78* | *49* | *10* | *-* | *1* | *60* |
| *04.05.74* | *42* | *17* | *-* | *1* | *60* |
| *13.05.71* | *43* | *17* | *-* | *-* | *60* |
| *09.05.68* | *56* | *3* | *1* | *-* | *60* |
| *07.05.64* | *37* | *13* | *6* | *-* | *56* |

*Source: London Borough Council Elections (Minors and Grenham 1998), Updated with local election results.*

**Table A5.4: Results of Local Government Elections**

London Borough of Brent

| Election Date | CON | LAB | LD | OTH | TOTAL |
|---|---|---|---|---|---|
| *02.05.02* | *16* | *35* | *9* | *-* | *60* |
| *07.05.98* | *19* | *43* | *4* | *-* | *66* |
| *05.05.94* | *33* | *28* | *5* | *-* | *66* |
| *03.05.90* | *31* | *29* | *6* | *-* | *66* |
| *08.05.86* | *20* | *43* | *3* | *-* | *66* |
| *06.05.82* | *30* | *33* | *3* | *-* | *66* |
| *04.05.78* | *27* | *39* | *-* | *-* | *66* |
| *04.05.74* | *25* | *35* | *-* | *-* | *60* |
| *13.05.71* | *22* | *38* | *-* | *-* | *60* |
| *09.05.68* | *49* | *11* | *-* | *-* | *60* |
| *07.05.64* | *26* | *34* | *-* | *-* | *60* |

*Source: London Borough Council Elections (Minors and Grenham 1998), Updated with local election results.*

**Table A5.5: Results of Local Government Elections**

Westminster City Council

| Election Date | CON | LAB | LD | OTH | TOTAL |
|---|---|---|---|---|---|
| *02.05.02* | *48* | *12* | *-* | *-* | *60* |
| *07.05.98* | *43* | *23* | *-* | *-* | *66* |
| *05.05.94* | *41* | *25* | *-* | *-* | *66* |
| *03.05.90* | *34* | *32* | *-* | *-* | *66* |
| *08.05.86* | *38* | *28* | *-* | *-* | *66* |
| *06.05.82* | *47* | *19* | *-* | *-* | *66* |
| *04.05.78* | *41* | *19* | *-* | *-* | *60* |
| *04.05.74* | *30* | *29* | *1* | *-* | *60* |
| *13.05.71* | *32* | *28* | *-* | *-* | *60* |
| *09.05.68* | *51* | *9* | *-* | *-* | *60* |
| *07.05.64* | *29* | *31* | *-* | *-* | *60* |

*Source: London Borough Council Elections (Minors and Grenham 1998), Updated with local election results.*

**Table A5.6: Results of Local Government Elections**

London Borough of Camden

| Election Date | CON | LAB | LD | OTH | TOTAL |
|---|---|---|---|---|---|
| *02.05.02* | *11* | *35* | *8* | *-* | *54* |
| *07.05.98* | *10* | *43* | *6* | *-* | *59* |
| *05.05.94* | *7* | *47* | *5* | *-* | *59* |
| *03.05.90* | *15* | *42* | *2* | *-* | *59* |
| *08.05.86* | *13* | *44* | *2* | *-* | *59* |
| *06.05.82* | *26* | *33* | *-* | *-* | *59* |
| *04.05.78* | *26* | *33* | *-* | *-* | *59* |
| *04.05.74* | *12* | *48* | *-* | *-* | *60* |
| *13.05.71* | *11* | *49* | *-* | *-* | *60* |
| *09.05.68* | *42* | *18* | *-* | *-* | *60* |
| *07.05.64* | *26* | *34* | *-* | *-* | *60* |

*Source: London Borough Council Elections (Minors and Grenham 1998), Updated with local election results.*

# APPENDIX 6

# TELEPHONE SURVEY RESULTS

## A6.1 INTRODUCTION

The telephone survey was designed following advice contained in *Survey Research Practice* (Hoinville and Jowell 1978) and it was based on the experience of Rogers (1976).

The co-operation of a local firm of chartered surveyors was obtained for this survey. The firm maintains a list of *applicants* registered as seeking a business property. At 1st November 1989 there were 743 applicants looking for industrial premises. Of these, 592 were companies already in business, the remainder being start up businesses or individuals. The firm is based in the London Borough of Enfield and the applicants were looking for premises predominantly in the London Boroughs of Enfield and Haringey.

A sample of 60 companies (10%) was surveyed during the first week of November 1989. The prospective occupiers were sorted in alphabetical order and every thirtieth name was extracted from the database. Most of the companies were seeking to hold the premises under an occupational lease and some would consider either freehold or leasehold. Both of these categories of company were included in the selection, but any business seeking only freehold ownership was excluded. A firm was selected if it was a single branch business looking to relocate. Multi-branch businesses were excluded but, beyond that, no attempt was made to control for comparability between businesses and no regard was paid to the business sector of the firm.

The target for this survey was to achieve 30 responses, which represents 5% of the total population. The survey was stopped once this response level was reached.

## A6.2 SURVEY QUESTION ANALYSIS

The Questionnaire used is included at the end of this appendix. The analysis of questions below is restricted to the substantive questions that help to give an understanding of prospective occupiers' attitudes.

## A6.2.1 RATES AS A BUSINESS COST

***Q2. What annual costs do you take into account when considering a property?***

The question was asked without prompting for possible answers. No attempt was made to rank costs in order of importance.

| | |
|---|---|
| Rent | 86.7% |
| Rates | 70.0% |
| Finance Costs | 16.7% |
| Service Charge | 10.0% |
| Other | 6.7% |
| Energy | 0.0% |

Items mentioned under the heading of other costs tended to relate to maintenance costs and repair costs. Those people who did not mention rates turned out to prefer freehold owner occupation to rental.

It can be seen that rates are second in importance only to rental costs.

***Q3. At what point in a purchase do you check the rateable value and rate burden for a property you are considering?***

Respondents were only permitted to choose one answer.

| | |
|---|---|
| Pre-Inspection | 30.0% |
| Pre-Offer | 33.3% |
| Pre-Exchange | 20.0% |
| Post-Exchange | 16.7% |
| | |
| Total | 100.0% |

Only following exchange of contracts is the occupier committed to that property. Up to that point it is possible to withdraw (or renegotiate terms).

Only 16.7% of occupiers enter into a binding commitment to take premises without full knowledge of the rates. It is suggested that even these occupiers will in fact have prior notice of the rate liability (through

their solicitors). Perhaps they only take notice of rate liability if it is especially large: it is possible that, for these businesses, premises are not a large proportion of their overheads. No consideration has been given to industry class in this survey.

***Q4a. Are there any local authority areas where you would avoid taking a property?***

The question was asked without prompting for possible answers but, by this stage of the survey, rate burden would have been uppermost in the mind of the respondent.

| | |
|---|---|
| Haringey | 53.3% |
| Waltham Forest | 6.7% |
| Enfield | 6.7% |
| Hackney | 3.3% |
| Camden | 3.3% |
| Barnet | 0.0% |
| Brent | 0.0% |

Haringey is cited by 53% as being an area that would be avoided. Interestingly, Enfield is also cited by some respondents.

***Q4b. What are the reasons you would avoid those local authority areas?***

Most respondents gave high rates as the reason but, as explained above, rate burden would have been the issue in the respondents' mind when answering this question.

The reasons given for avoiding an area were not restricted to rate burden. Other factors that influenced the choice of boroughs to avoid were political aversion to Labour and, in one case, Conservative local authorities. Planning policies were also stated as a reason in both Haringey and Enfield.

| | |
|---|---|
| High Rates | 63.3% |
| Politics of Borough | 16.6% |
| Planning Policies | 10.0% |
| Other | 3.3% |
| No reason given | 6.7% |

Outlying boroughs were mentioned only a few times. This can be explained in that applicants registered on this mailing list are generally looking in Enfield or Haringey.

***Q5a. Are there any local authority areas where you would prefer to be located?***

The question was asked without prompting for possible answers.

| | |
|---|---|
| Enfield | 58.4% |
| Barnet | 13.4% |
| Waltham Forest | 0.0% |
| Hackney | 0.0% |
| Camden | 0.0% |
| Haringey | 0.0% |
| Brent | 0.0% |

Enfield is stated by 58.4% as being an area that would be preferred and this is mainly because the rates are lower. This of course reflects a direct opposite of the tendency to avoid Haringey, answered by the respondents in Q4.

***Q5b. What are the reasons you would prefer those local authority areas?***

No respondent preferred to locate in a high rate area and none considered the possibility of better local services in one area over another. The chief explanation of a preference to be in Enfield and to a lesser extent Barnet is that the rates are lower (see Figure 5.5).

## A6.2.2 UNIFORM BUSINESS RATE

***Q6. Are you aware of the new system of business rates from next year [1990]?***

| | |
|---|---|
| Yes | 57% |
| No | 43% |

Obviously a small majority of respondents were aware of changes in the system. Even so, 43% is a large number with no awareness of changes in hand within the next six months.

***Q7. How familiar would you say you are with the way the new system works?***

This question was asked to those who responded Yes to question 5.

| | |
|---|---|
| Very familiar | 18.0% |
| Some idea | 12.0% |
| No real knowledge | 70.0% |
| | |
| Total | 100.0% |

Clearly the majority had 'no real knowledge' of the way the new system works. Aggregating the 'Very familiar' and the 'Some idea' respondents together and grouping those who responded 'No' to question five with those who had no real knowledge, we get the following information for the total sample.

| | |
|---|---|
| Knowledgeable | 16.7% |
| No real knowledge | 83.3% |

A surprising proportion had no knowledge of the new system. The importance of this is that the 'efficient market' hypothesis will not invalidate the research. In an efficient market, rational occupiers will adjust their rental bids to reflect all knowledge that is *available.* This would result in increased bids for high rate areas in the knowledge that the high rate burden will soon be removed.

# TELEPHONE SURVEY FORM

## TELEPHONE SURVEY

LSE

Nigel Mehdi
Nov 1989

N° |

Company Name

Contact | Tel N°

Call N° | 1 | 2 | 3 | Time | Date

You are registered with us looking for a commercial property. I am undertaking some research into business location decisions.

1. Can I take a couple of minutes of your time? | Yes | No

2. What are the annual costs that you take into account when considering a property? (respondent not to be prompted)

| Rent | Rates | Energy | Service Chg | Finance | Other |
|---|---|---|---|---|---|

Others

**If Rates not mentioned discontinue the interview, go to 8 below.**

3. You mentioned rates as an important cost for your business. At what point do you check the rateable value and rate burden for a property you are considering?

| Pre Inspection | Pre Offer | Pre Exchange | Post Exchange |
|---|---|---|---|

4a Are there any LA areas where you would avoid taking a property? (respondent not to be prompted)

| Enf | Barnt | Hgy | Hckny | WalF | Cam | Brent |
|---|---|---|---|---|---|---|

4b. What are the reasons you would avoid these areas.

5a Are there any LA areas where you would prefer to be located? (respondent not to be prompted)

| Enf | Barnt | Hgy | Hckny | WalF | Cam | Brent |
|---|---|---|---|---|---|---|

5b. What are the reasons you would prefer these areas.

6. Are you aware of the new system of business rates from next year? | Yes | No

7. How familiar would you say you were with the way the new system works?

| Very Familiar | Some Idea | No Real Knowledge |
|---|---|---|

8. Thank you for your time. Would you be prepared to take part in a similar survey in the future?

Entered |

**Figure A6.1: Form Used For Telephone Survey**

# APPENDIX 7

# PRIMARY DATA-SETS

The data-sets used in the primary analysis are set out in this appendix. These data-sets and the data collection process are described more fully in 7.5.

Table A7.1 gives an explanation of the abbreviated column headings used for the key variables that are listed. Not every data-set has all columns present.

**Table A7.1: Variable Descriptions used in Data-set Listings**

| Abbreviation | Description<br>*Comment* |
|---|---|
| PRN | Property Reference Number<br>*A unique identifier for each property: allocated at the point of data entry it is not consecutive across the final data used in the analysis.* |
| YEAR | Year in which the outcome variable of rent is observed. |
| LOC | Dummy variable used to handle the local authority area in the analysis. |
| RENT73 | Rental value per $m^2$ in 1973. |
| RENT88 | Outcome variable of rent per $m^2$ in 1988. |
| RATES88 | Rate burden per $m^2$ in 1988. |
| TOTOC88 | Total occupation costs (rent + rates) per $m^2$ in 1988. |
| RENT8x | Outcome variable of rent per $m^2$ in year from YEAR column. |
| RATES8x | Rate burden per $m^2$ in year from YEAR column. |
| TOTOC8x | Total occupation costs (rent + rates) per $m^2$ in year from YEAR column. |

## Table A7.2: Industrial Data-set A1

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT88 | RATES88 | TOTOC88 |
|---|---|---|---|---|---|---|
| 007-ENI | 1988 | 1 | 5.01 | 25.74 | 9.30 | 35.04 |
| 018-ENI | 1988 | 1 | 6.04 | 27.19 | 11.21 | 38.40 |
| 042-ENI | 1988 | 1 | 6.09 | 30.26 | 11.30 | 41.56 |
| 063-ENI | 1988 | 1 | 5.20 | 26.35 | 9.65 | 36.00 |
| 070-ENI | 1988 | 1 | 3.21 | 21.67 | 5.95 | 27.62 |
| 144-ENI | 1988 | 1 | 5.82 | 39.19 | 10.80 | 49.99 |
| 151-ENI | 1988 | 1 | 7.23 | 43.91 | 13.42 | 57.33 |
| 184-ENI | 1988 | 1 | 8.10 | 59.21 | 15.03 | 74.24 |
| 185-ENI | 1988 | 1 | 10.97 | 63.60 | 20.34 | 83.94 |
| 189-ENI | 1988 | 1 | 8.77 | 60.31 | 16.27 | 76.58 |
| 197-ENI | 1988 | 1 | 7.83 | 57.89 | 14.51 | 72.40 |
| 205-ENI | 1988 | 1 | 5.30 | 26.18 | 9.82 | 36.00 |
| 219-ENI | 1988 | 1 | 7.23 | 41.55 | 13.42 | 54.97 |
| 231-ENI | 1988 | 1 | 6.60 | 29.65 | 12.25 | 41.90 |
| 253-ENI | 1988 | 1 | 8.52 | 53.57 | 15.80 | 69.37 |
| 263-ENI | 1988 | 1 | 6.86 | 51.08 | 12.73 | 63.81 |
| 276-ENI | 1988 | 1 | 7.49 | 41.24 | 13.90 | 55.14 |
| 298-ENI | 1988 | 1 | 6.77 | 40.24 | 12.56 | 52.80 |
| 303-ENI | 1988 | 1 | 6.70 | 42.98 | 12.43 | 55.41 |
| 304-ENI | 1988 | 1 | 5.68 | 35.92 | 10.54 | 46.46 |
| 325-ENI | 1988 | 1 | 6.52 | 31.14 | 12.10 | 43.24 |
| 353-ENI | 1988 | 1 | 5.84 | 31.74 | 10.84 | 42.58 |
| 378-ENI | 1988 | 1 | 6.09 | 40.95 | 11.30 | 52.25 |
| 387-ENI | 1988 | 1 | 8.84 | 58.17 | 16.41 | 74.58 |
| 390-ENI | 1988 | 1 | 7.01 | 60.44 | 13.01 | 73.45 |
| 398-ENI | 1988 | 1 | 8.05 | 53.99 | 14.93 | 68.92 |
| 445-ENI | 1988 | 1 | 8.24 | 59.34 | 15.29 | 74.63 |
| 458-ENI | 1988 | 1 | 6.99 | 43.52 | 12.96 | 56.48 |
| 460-ENI | 1988 | 1 | 3.47 | 19.15 | 6.44 | 25.59 |

Table continued...

Table continuation...

## Table A7.2: Industrial Data-set A1

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT88 | RATES88 | TOTOC88 |
|---|---|---|---|---|---|---|
| 466-ENI | 1988 | 1 | 9.94 | 45.60 | 18.43 | 64.03 |
| 541-ENI | 1988 | 1 | 7.86 | 54.88 | 14.58 | 69.46 |
| 647-ENI | 1988 | 1 | 6.53 | 36.00 | 12.12 | 48.12 |
| 704-ENI | 1988 | 1 | 8.89 | 62.50 | 16.50 | 79.00 |
| 726-ENI | 1988 | 1 | 7.63 | 43.22 | 14.15 | 57.37 |
| 854-ENI | 1988 | 1 | 6.90 | 42.24 | 12.79 | 55.03 |
| 025-HAI | 1988 | 2 | 6.34 | 24.88 | 17.09 | 41.97 |
| 049-HAI | 1988 | 2 | 4.87 | 33.56 | 13.12 | 46.68 |
| 058-HAI | 1988 | 2 | 5.58 | 23.18 | 15.05 | 38.23 |
| 157-HAI | 1988 | 2 | 5.95 | 32.14 | 16.05 | 48.19 |
| 169-HAI | 1988 | 2 | 6.07 | 35.77 | 16.36 | 52.13 |
| 180-HAI | 1988 | 2 | 6.90 | 43.32 | 18.61 | 61.93 |
| 212-HAI | 1988 | 2 | 9.17 | 55.91 | 24.71 | 80.62 |
| 225-HAI | 1988 | 2 | 7.58 | 39.39 | 20.43 | 59.82 |
| 241-HAI | 1988 | 2 | 5.78 | 32.84 | 15.58 | 48.42 |
| 244-HAI | 1988 | 2 | 7.24 | 45.68 | 19.51 | 65.19 |
| 255-HAI | 1988 | 2 | 5.29 | 29.36 | 14.25 | 43.61 |
| 268-HAI | 1988 | 2 | 6.69 | 37.17 | 18.03 | 55.20 |
| 291-HAI | 1988 | 2 | 7.26 | 42.80 | 19.56 | 62.36 |
| 295-HAI | 1988 | 2 | 7.59 | 40.49 | 20.47 | 60.96 |
| 308-HAI | 1988 | 2 | 8.32 | 47.07 | 22.43 | 69.50 |
| 313-HAI | 1988 | 2 | 8.26 | 55.06 | 22.27 | 77.33 |
| 337-HAI | 1988 | 2 | 6.46 | 40.29 | 17.41 | 57.70 |
| 341-HAI | 1988 | 2 | 7.25 | 38.94 | 19.54 | 58.48 |
| 350-HAI | 1988 | 2 | 7.46 | 47.30 | 20.11 | 67.41 |
| 364-HAI | 1988 | 2 | 5.68 | 32.61 | 15.32 | 47.93 |
| 376-HAI | 1988 | 2 | 7.26 | 41.98 | 19.58 | 61.56 |
| 385-HAI | 1988 | 2 | 4.98 | 26.46 | 13.43 | 39.89 |

Table continued...

Table continuation...

## Table A7.2: Industrial Data-set A1

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT88 | RATES88 | TOTOC88 |
|---|---|---|---|---|---|---|
| 392-HAI | 1988 | 2 | 6.27 | 38.01 | 16.90 | 54.91 |
| 424-HAI | 1988 | 2 | 4.43 | 42.82 | 11.94 | 54.76 |
| 429-HAI | 1988 | 2 | 8.47 | 38.41 | 22.83 | 61.24 |
| 431-HAI | 1988 | 2 | 6.61 | 35.10 | 17.81 | 52.91 |
| 447-HAI | 1988 | 2 | 6.21 | 33.69 | 16.74 | 50.43 |
| 448-HAI | 1988 | 2 | 7.68 | 42.60 | 20.71 | 63.31 |
| 461-HAI | 1988 | 2 | 6.28 | 34.80 | 16.92 | 51.72 |
| 469-HAI | 1988 | 2 | 8.44 | 42.18 | 22.76 | 64.94 |
| 502-HAI | 1988 | 2 | 6.16 | 37.43 | 16.61 | 54.04 |
| 549-HAI | 1988 | 2 | 6.38 | 34.85 | 17.20 | 52.05 |
| 656-HAI | 1988 | 2 | 5.50 | 31.20 | 14.82 | 46.02 |
| 873-HAI | 1988 | 2 | 8.19 | 34.92 | 22.07 | 56.99 |
| 933-HAI | 1988 | 2 | 8.13 | 52.50 | 21.91 | 74.41 |

## Table A7.3: Retail Data-set C1

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT88 | RATES88 | TOTOC88 |
|---|---|---|---|---|---|---|
| 346-BAR | 1988 | 3 | 15.33 | 97.15 | 28.35 | 125.49 |
| 382-BAR | 1988 | 3 | 13.62 | 108.25 | 25.19 | 133.45 |
| 473-BAR | 1988 | 3 | 13.76 | 110.01 | 25.45 | 135.45 |
| 485-BAR | 1988 | 3 | 19.10 | 141.17 | 35.32 | 176.49 |
| 493-BAR | 1988 | 3 | 20.14 | 155.49 | 37.23 | 192.72 |
| 496-BAR | 1988 | 3 | 13.09 | 105.39 | 24.20 | 129.58 |
| 516-BAR | 1988 | 3 | 20.44 | 115.42 | 37.80 | 153.22 |
| 554-BAR | 1988 | 3 | 18.60 | 118.10 | 34.39 | 152.49 |
| 560-BAR | 1988 | 3 | 19.72 | 121.90 | 36.46 | 158.35 |
| 569-BAR | 1988 | 3 | 14.67 | 117.66 | 27.13 | 144.80 |
| 573-BAR | 1988 | 3 | 11.27 | 86.21 | 20.85 | 107.06 |
| 586-BAR | 1988 | 3 | 16.01 | 93.89 | 29.60 | 123.50 |
| 605-BAR | 1988 | 3 | 17.25 | 148.10 | 31.89 | 179.99 |
| 614-BAR | 1988 | 3 | 22.98 | 124.16 | 42.49 | 166.65 |
| 617-BAR | 1988 | 3 | 12.90 | 100.46 | 23.85 | 124.31 |
| 633-BAR | 1988 | 3 | 18.08 | 134.44 | 33.42 | 167.86 |
| 651-BAR | 1988 | 3 | 13.19 | 167.28 | 24.39 | 191.67 |
| 655-BAR | 1988 | 3 | 16.85 | 137.66 | 31.15 | 168.81 |
| 679-BAR | 1988 | 3 | 20.90 | 143.60 | 38.65 | 182.25 |
| 711-BAR | 1988 | 3 | 21.43 | 151.69 | 39.62 | 191.31 |
| 715-BAR | 1988 | 3 | 20.76 | 156.32 | 38.38 | 194.70 |
| 374-BRR | 1988 | 4 | 14.06 | 97.48 | 30.00 | 127.48 |
| 383-BRR | 1988 | 4 | 18.00 | 124.66 | 38.41 | 163.08 |
| 523-BRR | 1988 | 4 | 21.52 | 117.72 | 45.93 | 163.65 |
| 525-BRR | 1988 | 4 | 16.02 | 108.16 | 34.18 | 142.34 |
| 578-BRR | 1988 | 4 | 15.96 | 109.43 | 34.06 | 143.50 |
| 591-BRR | 1988 | 4 | 15.56 | 104.95 | 33.21 | 138.16 |
| 594-BRR | 1988 | 4 | 17.56 | 109.09 | 37.48 | 146.57 |
| 602-BRR | 1988 | 4 | 16.20 | 109.38 | 34.57 | 143.95 |

Table continued...

Table continuation...

**Table A7.3: Retail Data-set C1**

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT88 | RATES88 | TOTOC88 |
|---|---|---|---|---|---|---|
| 620-BRR | 1988 | 4 | 16.35 | 110.89 | 34.89 | 145.78 |
| 649-BRR | 1988 | 4 | 15.75 | 106.93 | 33.62 | 140.55 |
| 666-BRR | 1988 | 4 | 19.66 | 138.00 | 41.95 | 179.95 |
| 677-BRR | 1988 | 4 | 18.29 | 122.86 | 39.03 | 161.89 |
| 683-BRR | 1988 | 4 | 17.99 | 109.73 | 38.39 | 148.12 |
| 695-BRR | 1988 | 4 | 17.44 | 107.58 | 37.21 | 144.79 |
| 698-BRR | 1988 | 4 | 19.83 | 121.05 | 42.32 | 163.37 |
| 707-BRR | 1988 | 4 | 20.96 | 127.62 | 44.73 | 172.35 |
| 731-BRR | 1988 | 4 | 19.30 | 111.20 | 41.18 | 152.38 |
| 763-BRR | 1988 | 4 | 16.29 | 99.74 | 34.77 | 134.50 |
| 788-BRR | 1988 | 4 | 20.90 | 133.01 | 44.60 | 177.61 |
| 816-BRR | 1988 | 4 | 13.62 | 120.85 | 29.07 | 149.92 |
| 935-BRR | 1988 | 4 | 22.42 | 122.33 | 47.83 | 170.16 |

## Table A7.4: Office Data-set E1

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT88 | RATES88 | TOTOC88 |
|---|---|---|---|---|---|---|
| 743-WEO | 1988 | 5 | 21.27 | 245.61 | 34.65 | 280.26 |
| 749-WEO | 1988 | 5 | 43.38 | 297.09 | 70.67 | 367.76 |
| 755-WEO | 1988 | 5 | 54.63 | 351.34 | 88.99 | 440.33 |
| 756-WEO | 1988 | 5 | 42.62 | 287.18 | 69.43 | 356.61 |
| 760-WEO | 1988 | 5 | 31.99 | 263.33 | 52.11 | 315.44 |
| 774-WEO | 1988 | 5 | 33.60 | 290.12 | 54.73 | 344.85 |
| 807-WEO | 1988 | 5 | 28.54 | 234.00 | 46.49 | 280.49 |
| 828-WEO | 1988 | 5 | 33.15 | 220.70 | 54.00 | 274.70 |
| 833-WEO | 1988 | 5 | 36.49 | 289.60 | 59.44 | 349.04 |
| 844-WEO | 1988 | 5 | 31.44 | 215.28 | 51.22 | 266.50 |
| 869-WEO | 1988 | 5 | 32.29 | 362.48 | 52.60 | 415.08 |
| 871-WEO | 1988 | 5 | 51.76 | 285.43 | 84.32 | 369.75 |
| 872-WEO | 1988 | 5 | 23.42 | 375.00 | 38.15 | 413.15 |
| 886-WEO | 1988 | 5 | 43.60 | 283.71 | 71.02 | 354.73 |
| 891-WEO | 1988 | 5 | 34.58 | 375.57 | 56.33 | 431.90 |
| 909-WEO | 1988 | 5 | 22.17 | 237.94 | 36.11 | 274.05 |
| 916-WEO | 1988 | 5 | 36.17 | 331.26 | 58.92 | 390.18 |
| 929-WEO | 1988 | 5 | 22.83 | 275.72 | 37.19 | 312.91 |
| 941-WEO | 1988 | 5 | 36.12 | 336.23 | 58.84 | 395.07 |
| 945-WEO | 1988 | 5 | 31.17 | 264.79 | 50.78 | 315.57 |
| 946-WEO | 1988 | 5 | 41.49 | 365.43 | 67.59 | 433.02 |
| 746-CAO | 1988 | 6 | 10.24 | 203.13 | 23.73 | 226.86 |
| 753-CAO | 1988 | 6 | 10.19 | 226.02 | 23.61 | 249.63 |
| 765-CAO | 1988 | 6 | 31.30 | 242.65 | 72.52 | 315.17 |
| 775-CAO | 1988 | 6 | 42.81 | 351.24 | 99.19 | 450.43 |
| 778-CAO | 1988 | 6 | 53.86 | 237.68 | 124.79 | 362.47 |
| 780-CAO | 1988 | 6 | 39.63 | 251.05 | 91.82 | 342.87 |
| 797-CAO | 1988 | 6 | 31.01 | 259.35 | 71.85 | 331.20 |
| 802-CAO | 1988 | 6 | 53.23 | 340.48 | 123.33 | 463.81 |

Table continued...

Table continuation...

**Table A7.4: Office Data-set E1**

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT88 | RATES88 | TOTOC88 |
|---|---|---|---|---|---|---|
| 811-CAO | 1988 | 6 | 53.07 | 229.03 | 122.96 | 351.99 |
| 817-CAO | 1988 | 6 | 72.52 | 325.27 | 168.03 | 493.30 |
| 824-CAO | 1988 | 6 | 26.73 | 243.77 | 61.93 | 305.70 |
| 826-CAO | 1988 | 6 | 14.34 | 243.06 | 33.23 | 276.29 |
| 834-CAO | 1988 | 6 | 24.59 | 291.67 | 56.98 | 348.65 |
| 842-CAO | 1988 | 6 | 51.36 | 245.82 | 119.00 | 364.82 |
| 852-CAO | 1988 | 6 | 27.24 | 281.33 | 63.12 | 344.45 |
| 855-CAO | 1988 | 6 | 22.27 | 232.06 | 51.60 | 283.66 |
| 860-CAO | 1988 | 6 | 29.29 | 243.92 | 67.86 | 311.78 |
| 911-CAO | 1988 | 6 | 65.09 | 288.77 | 150.81 | 439.58 |
| 924-CAO | 1988 | 6 | 42.45 | 273.25 | 98.36 | 371.61 |
| 939-CAO | 1988 | 6 | 30.84 | 261.17 | 71.46 | 332.63 |
| 947-CAO | 1988 | 6 | 33.96 | 285.14 | 78.69 | 363.83 |

## Table A7.5: Sibley's Office Data-set

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT8x | RATES8x | TOTOC8x |
|---|---|---|---|---|---|---|
| 074-WEO | 1983 | 5 | 21.12 | 141.33 | 32.72 | 174.05 |
| 075-WEO | 1983 | 5 | 43.06 | 145.31 | 66.63 | 211.94 |
| 076-WEO | 1983 | 5 | 44.05 | 141.11 | 68.24 | 209.36 |
| 077-WEO | 1983 | 5 | 54.56 | 134.98 | 84.50 | 219.48 |
| 078-WEO | 1983 | 5 | 58.88 | 125.40 | 91.17 | 216.57 |
| 079-WEO | 1983 | 5 | 42.83 | 123.78 | 66.31 | 190.09 |
| 080-WEO | 1983 | 5 | 55.63 | 127.12 | 86.11 | 213.23 |
| 081-WEO | 1984 | 5 | 42.40 | 129.17 | 66.31 | 195.47 |
| 082-WEO | 1984 | 5 | 44.91 | 108.93 | 70.29 | 179.22 |
| 083-WEO | 1984 | 5 | 31.93 | 151.88 | 49.94 | 201.82 |
| 084-WEO | 1984 | 5 | 33.92 | 129.17 | 53.07 | 182.23 |
| 085-WEO | 1984 | 5 | 28.83 | 130.78 | 45.10 | 175.88 |
| 086-WEO | 1984 | 5 | 33.41 | 148.54 | 52.31 | 200.85 |
| 087-WEO | 1984 | 5 | 36.18 | 129.17 | 56.62 | 185.79 |
| 088-WEO | 1984 | 5 | 31.69 | 106.13 | 49.62 | 155.75 |
| 089-WEO | 1984 | 5 | 29.37 | 85.36 | 45.96 | 131.32 |
| 090-WEO | 1985 | 5 | 32.57 | 210.00 | 53.39 | 263.39 |
| 091-WEO | 1985 | 5 | 51.21 | 136.06 | 84.07 | 220.12 |
| 092-WEO | 1985 | 5 | 19.71 | 132.07 | 32.29 | 164.36 |
| 093-WEO | 1985 | 5 | 23.98 | 138.85 | 39.40 | 178.25 |
| 094-WEO | 1985 | 5 | 40.31 | 181.69 | 70.72 | 252.41 |
| 095-WEO | 1985 | 5 | 46.28 | 172.22 | 75.99 | 248.22 |
| 096-WEO | 1985 | 5 | 43.73 | 156.08 | 71.80 | 227.87 |
| 097-WEO | 1985 | 5 | 34.08 | 161.46 | 55.97 | 217.43 |
| 098-WEO | 1985 | 5 | 37.18 | 122.71 | 61.03 | 183.74 |
| 099-WEO | 1985 | 5 | 21.92 | 177.07 | 35.95 | 213.02 |
| 100-WEO | 1985 | 5 | 36.88 | 108.50 | 60.49 | 168.99 |
| 101-WEO | 1985 | 5 | 27.00 | 161.46 | 44.35 | 205.81 |

Table continued...

Table continuation...

## Table A7.5: Sibley's Office Data-set

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT8x | RATES8x | TOTOC8x |
|---|---|---|---|---|---|---|
| 102-WEO | 1985 | 5 | 22.62 | 171.90 | 37.57 | 209.47 |
| 103-WEO | 1985 | 5 | 36.01 | 122.71 | 80.84 | 203.55 |
| 104-WEO | 1985 | 5 | 24.65 | 141.65 | 40.47 | 182.13 |
| 105-WEO | 1985 | 5 | 31.29 | 161.46 | 51.34 | 212.80 |
| 106-WEO | 1985 | 5 | 41.60 | 170.93 | 68.24 | 239.17 |
| 107-CAO | 1983 | 6 | 72.71 | 136.81 | 150.48 | 287.29 |
| 108-CAO | 1983 | 6 | 31.04 | 121.74 | 64.26 | 186.00 |
| 109-CAO | 1983 | 6 | 49.42 | 129.17 | 102.26 | 231.42 |
| 110-CAO | 1983 | 6 | 10.51 | 158.55 | 21.74 | 180.30 |
| 111-CAO | 1983 | 6 | 31.04 | 125.83 | 64.26 | 190.09 |
| 112-CAO | 1983 | 6 | 64.77 | 141.87 | 134.01 | 275.88 |
| 113-CAO | 1983 | 6 | 53.70 | 107.64 | 111.08 | 218.72 |
| 114-CAO | 1984 | 6 | 30.18 | 135.63 | 66.74 | 202.36 |
| 115-CAO | 1984 | 6 | 14.07 | 86.11 | 31.11 | 117.22 |
| 116-CAO | 1984 | 6 | 27.18 | 146.82 | 60.17 | 206.99 |
| 117-CAO | 1984 | 6 | 79.56 | 174.59 | 175.99 | 350.58 |
| 118-CAO | 1984 | 6 | 29.69 | 128.41 | 65.66 | 194.07 |
| 119-CAO | 1984 | 6 | 33.56 | 161.46 | 74.27 | 235.73 |
| 120-CAO | 1984 | 6 | 53.98 | 127.34 | 119.37 | 246.71 |
| 121-CAO | 1984 | 6 | 24.25 | 138.85 | 53.60 | 192.46 |
| 122-CAO | 1984 | 6 | 41.11 | 104.95 | 90.96 | 195.90 |
| 123-CAO | 1985 | 6 | 34.58 | 99.46 | 78.68 | 178.14 |
| 124-CAO | 1985 | 6 | 46.75 | 165.76 | 106.78 | 272.54 |
| 125-CAO | 1985 | 6 | 30.18 | 140.36 | 68.67 | 209.04 |
| 126-CAO | 1985 | 6 | 31.58 | 140.15 | 71.80 | 211.94 |
| 127-CAO | 1985 | 6 | 42.34 | 154.89 | 96.34 | 251.23 |
| 128-CAO | 1985 | 6 | 10.95 | 88.37 | 24.86 | 113.24 |
| 129-CAO | 1985 | 6 | 22.06 | 149.08 | 50.27 | 199.35 |

Table continued...

Table continuation...

**Table A7.5: Sibley's Office Data-set**

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT8x | RATES8x | TOTOC8x |
|---|---|---|---|---|---|---|
| 130-CAO | 1985 | 6 | 42.29 | 119.05 | 96.23 | 215.28 |
| 131-CAO | 1985 | 6 | 39.50 | 127.77 | 89.88 | 217.65 |
| 132-CAO | 1985 | 6 | 42.80 | 127.44 | 97.41 | 224.86 |
| 133-CAO | 1985 | 6 | 53.98 | 108.72 | 122.82 | 231.53 |
| 134-CAO | 1985 | 6 | 31.31 | 139.93 | 71.26 | 211.19 |
| 135-CAO | 1985 | 6 | 26.85 | 120.34 | 61.14 | 181.48 |
| 136-CAO | 1985 | 6 | 38.06 | 113.02 | 86.65 | 199.67 |
| 137-CAO | 1985 | 6 | 51.47 | 150.69 | 117.11 | 267.81 |
| 138-CAO | 1985 | 6 | 33.12 | 147.68 | 75.35 | 223.03 |
| 139-CAO | 1985 | 6 | 33.11 | 143.16 | 75.35 | 218.51 |

## Table A7.6: Industrial Data-set A2

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT88 | RATES88 | TOTOC88 |
|---|---|---|---|---|---|---|
| 004-ENI | 1988 | 1 | 4.96 | 34.74 | 9.20 | 43.94 |
| 012-ENI | 1988 | 1 | 6.01 | 35.51 | 11.15 | 46.66 |
| 014-ENI | 1988 | 1 | 6.69 | 36.74 | 12.41 | 49.15 |
| 021-ENI | 1988 | 1 | 7.92 | 37.51 | 14.69 | 52.20 |
| 022-ENI | 1988 | 1 | 3.41 | 22.50 | 6.33 | 28.83 |
| 028-ENI | 1988 | 1 | 6.11 | 34.40 | 11.33 | 45.73 |
| 033-ENI | 1988 | 1 | 6.85 | 34.00 | 12.71 | 46.71 |
| 039-ENI | 1988 | 1 | 6.73 | 34.54 | 12.48 | 47.02 |
| 045-ENI | 1988 | 1 | 6.09 | 40.94 | 11.30 | 52.24 |
| 048-ENI | 1988 | 1 | 4.77 | 31.20 | 8.85 | 40.05 |
| 052-ENI | 1988 | 1 | 6.87 | 37.75 | 12.74 | 50.49 |
| 061-ENI | 1988 | 1 | 7.77 | 36.58 | 14.41 | 50.99 |
| 066-ENI | 1988 | 1 | 8.38 | 41.10 | 15.54 | 56.64 |
| 067-ENI | 1988 | 1 | 9.67 | 46.50 | 17.94 | 64.44 |
| 073-ENI | 1988 | 1 | 4.83 | 34.00 | 8.96 | 42.96 |
| 140-ENI | 1988 | 1 | 5.27 | 33.21 | 9.78 | 42.99 |
| 142-ENI | 1988 | 1 | 5.45 | 32.28 | 10.11 | 42.39 |
| 150-ENI | 1988 | 1 | 10.18 | 45.80 | 18.88 | 64.68 |
| 154-ENI | 1988 | 1 | 7.52 | 37.12 | 13.95 | 51.07 |
| 162-ENI | 1988 | 1 | 7.51 | 35.77 | 13.93 | 49.70 |
| 164-ENI | 1988 | 1 | 7.61 | 29.13 | 14.12 | 43.25 |
| 167-ENI | 1988 | 1 | 5.16 | 36.99 | 9.57 | 46.56 |
| 171-ENI | 1988 | 1 | 5.49 | 30.81 | 10.18 | 40.99 |
| 176-ENI | 1988 | 1 | 6.24 | 36.22 | 11.58 | 47.80 |
| 177-ENI | 1988 | 1 | 6.00 | 35.47 | 11.13 | 46.60 |
| 186-ENI | 1988 | 1 | 6.81 | 45.21 | 12.63 | 57.84 |
| 188-ENI | 1988 | 1 | 5.81 | 38.49 | 10.78 | 49.27 |
| 191-ENI | 1988 | 1 | 5.04 | 39.51 | 9.35 | 48.86 |
| 193-ENI | 1988 | 1 | 4.66 | 36.00 | 8.64 | 44.64 |

Table continued...

Table continuation...

## Table A7.6: Industrial Data-set A2

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT88 | RATES88 | TOTOC88 |
|---|---|---|---|---|---|---|
| 199-ENI | 1988 | 1 | 9.73 | 42.78 | 18.05 | 60.83 |
| 202-ENI | 1988 | 1 | 4.66 | 36.63 | 8.64 | 45.27 |
| 206-ENI | 1988 | 1 | 7.97 | 41.40 | 14.78 | 56.18 |
| 208-ENI | 1988 | 1 | 7.41 | 39.74 | 13.75 | 53.49 |
| 209-ENI | 1988 | 1 | 8.01 | 44.63 | 14.86 | 59.49 |
| 210-ENI | 1988 | 1 | 7.91 | 46.74 | 14.67 | 61.41 |
| 211-ENI | 1988 | 1 | 7.66 | 35.98 | 14.21 | 50.19 |
| 218-ENI | 1988 | 1 | 5.22 | 32.58 | 9.68 | 42.26 |
| 221-ENI | 1988 | 1 | 5.77 | 33.29 | 10.70 | 43.99 |
| 227-ENI | 1988 | 1 | 7.48 | 36.51 | 13.88 | 50.39 |
| 230-ENI | 1988 | 1 | 7.34 | 38.25 | 13.62 | 51.87 |
| 235-ENI | 1988 | 1 | 4.51 | 31.48 | 8.37 | 39.85 |
| 236-ENI | 1988 | 1 | 6.91 | 37.76 | 12.82 | 50.58 |
| 246-ENI | 1988 | 1 | 8.49 | 45.75 | 15.75 | 61.50 |
| 250-ENI | 1988 | 1 | 7.35 | 39.44 | 13.63 | 53.07 |
| 251-ENI | 1988 | 1 | 6.58 | 34.45 | 12.21 | 46.66 |
| 259-ENI | 1988 | 1 | 8.31 | 39.38 | 15.42 | 54.80 |
| 262-ENI | 1988 | 1 | 5.11 | 36.21 | 9.48 | 45.69 |
| 273-ENI | 1988 | 1 | 6.76 | 38.63 | 12.54 | 51.17 |
| 286-ENI | 1988 | 1 | 5.91 | 34.28 | 10.96 | 45.24 |
| 292-ENI | 1988 | 1 | 5.89 | 32.10 | 10.93 | 43.03 |
| 296-ENI | 1988 | 1 | 8.21 | 36.80 | 15.23 | 52.03 |
| 318-ENI | 1988 | 1 | 8.42 | 38.60 | 15.62 | 54.22 |
| 322-ENI | 1988 | 1 | 7.23 | 39.49 | 13.41 | 52.90 |
| 686-ENI | 1988 | 1 | 6.63 | 30.21 | 12.30 | 42.51 |
| 821-ENI | 1988 | 1 | 5.52 | 36.45 | 10.24 | 46.69 |
| 835-ENI | 1988 | 1 | 7.55 | 38.90 | 14.01 | 52.91 |
| 847-ENI | 1988 | 1 | 8.21 | 43.63 | 15.23 | 58.86 |

Table continued...

Table continuation...

## Table A7.6: Industrial Data-set A2

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT88 | RATES88 | TOTOC88 |
|---|---|---|---|---|---|---|
| 056-HGI | 1988 | 2 | 8.34 | 32.89 | 22.48 | 55.37 |
| 173-HGI | 1988 | 2 | 6.33 | 36.85 | 17.06 | 53.91 |
| 182-HGI | 1988 | 2 | 7.72 | 36.04 | 20.81 | 56.85 |
| 198-HGI | 1988 | 2 | 6.20 | 33.11 | 16.71 | 49.82 |
| 238-HGI | 1988 | 2 | 8.35 | 41.23 | 22.50 | 63.73 |
| 242-HGI | 1988 | 2 | 8.39 | 37.31 | 22.61 | 59.92 |
| 243-HGI | 1988 | 2 | 6.68 | 32.67 | 18.00 | 50.67 |
| 271-HGI | 1988 | 2 | 6.65 | 34.54 | 17.92 | 52.46 |
| 280-HGI | 1988 | 2 | 8.08 | 37.14 | 21.78 | 58.92 |
| 284-HGI | 1988 | 2 | 8.13 | 39.64 | 21.91 | 61.55 |
| 293-HGI | 1988 | 2 | 4.34 | 25.00 | 11.70 | 36.70 |
| 310-HGI | 1988 | 2 | 8.57 | 37.52 | 23.10 | 60.62 |
| 316-HGI | 1988 | 2 | 6.31 | 36.51 | 17.01 | 53.52 |
| 321-HGI | 1988 | 2 | 8.16 | 33.82 | 21.99 | 55.81 |
| 327-HGI | 1988 | 2 | 6.22 | 36.27 | 16.76 | 53.03 |
| 328-HGI | 1988 | 2 | 7.09 | 29.44 | 19.11 | 48.55 |
| 331-HGI | 1988 | 2 | 5.50 | 35.78 | 14.82 | 50.60 |
| 332-HGI | 1988 | 2 | 7.19 | 47.25 | 19.38 | 66.63 |
| 349-HGI | 1988 | 2 | 6.48 | 33.45 | 17.46 | 50.91 |
| 357-HGI | 1988 | 2 | 6.26 | 34.36 | 16.87 | 51.23 |
| 360-HGI | 1988 | 2 | 6.25 | 36.15 | 16.84 | 52.99 |
| 361-HGI | 1988 | 2 | 4.81 | 26.65 | 12.96 | 39.61 |
| 368-HGI | 1988 | 2 | 7.95 | 35.77 | 21.43 | 57.20 |
| 372-HGI | 1988 | 2 | 6.39 | 41.54 | 17.22 | 58.76 |
| 381-HGI | 1988 | 2 | 7.21 | 34.10 | 19.43 | 53.53 |
| 397-HGI | 1988 | 2 | 5.40 | 30.59 | 14.55 | 45.14 |
| 402-HGI | 1988 | 2 | 8.49 | 36.22 | 22.88 | 59.10 |
| 408-HGI | 1988 | 2 | 5.93 | 33.03 | 15.98 | 49.01 |

Table continued...

Table continuation...

## Table A7.6: Industrial Data-set A2

See Table A7.1 for an explanation of the headings.

| PRN | YEAR | LOC | RENT73 | RENT88 | RATES88 | TOTOC88 |
|---|---|---|---|---|---|---|
| 410-HGI | 1988 | 2 | 7.13 | 36.32 | 19.22 | 55.54 |
| 411-HGI | 1988 | 2 | 4.49 | 28.43 | 12.10 | 40.53 |
| 415-HGI | 1988 | 2 | 7.64 | 34.67 | 20.59 | 55.26 |
| 420-HGI | 1988 | 2 | 6.59 | 35.84 | 17.76 | 53.60 |
| 422-HGI | 1988 | 2 | 6.41 | 35.14 | 17.27 | 52.41 |
| 423-HGI | 1988 | 2 | 8.15 | 44.35 | 21.96 | 66.31 |
| 425-HGI | 1988 | 2 | 8.51 | 29.58 | 22.93 | 52.51 |
| 434-HGI | 1988 | 2 | 6.21 | 38.30 | 16.74 | 55.04 |
| 439-HGI | 1988 | 2 | 7.26 | 34.52 | 19.57 | 54.09 |
| 444-HGI | 1988 | 2 | 6.19 | 25.25 | 16.68 | 41.93 |
| 456-HGI | 1988 | 2 | 8.28 | 38.97 | 22.31 | 61.28 |
| 459-HGI | 1988 | 2 | 6.51 | 35.54 | 17.54 | 53.08 |
| 464-HGI | 1988 | 2 | 5.28 | 31.33 | 14.23 | 45.56 |
| 472-HGI | 1988 | 2 | 5.09 | 30.17 | 13.72 | 43.89 |
| 477-HGI | 1988 | 2 | 7.68 | 36.58 | 20.70 | 57.28 |
| 479-HGI | 1988 | 2 | 8.55 | 41.68 | 23.04 | 64.72 |
| 480-HGI | 1988 | 2 | 6.10 | 36.77 | 16.44 | 53.21 |
| 487-HGI | 1988 | 2 | 4.33 | 35.34 | 11.67 | 47.01 |
| 492-HGI | 1988 | 2 | 8.60 | 37.58 | 23.18 | 60.76 |
| 498-HGI | 1988 | 2 | 6.17 | 35.36 | 16.63 | 51.99 |
| 510-HGI | 1988 | 2 | 6.24 | 35.25 | 16.82 | 52.07 |
| 511-HGI | 1988 | 2 | 8.44 | 38.27 | 22.75 | 61.02 |
| 527-HGI | 1988 | 2 | 5.45 | 34.61 | 14.69 | 49.30 |
| 533-HGI | 1988 | 2 | 6.24 | 36.10 | 16.82 | 52.92 |
| 534-HGI | 1988 | 2 | 5.67 | 36.35 | 15.28 | 51.63 |
| 547-HGI | 1988 | 2 | 8.19 | 42.02 | 22.07 | 64.09 |
| 565-HGI | 1988 | 2 | 7.26 | 40.15 | 19.57 | 59.72 |
| 616-HGI | 1988 | 2 | 6.44 | 48.68 | 17.36 | 66.04 |
| 793-HGI | 1988 | 2 | 5.71 | 37.51 | 15.39 | 52.90 |

# APPENDIX 8

# ANALYSIS OF INDUSTRIAL DATA-SET A2

## A8.1 PARTLY MATCHED PAIRS – INDUSTRIAL DATA-SET A2

The tables in this appendix show the results from the analysis of Data-set A2, which contains 57 industrial property pairs that could not be fully matched (see Table 7.4 for a listing of the industrial data-sets that were collected). The tests and statistical hypotheses set out in 8.4 are applied to this data.

The industrial matching criteria were set out in Figure 7.1a. The pairs in this data-set could only be partly matched, on size and age for all data, but not consistently on the other matching criteria.

The results of this analysis are inconclusive, when compared to the same results presented for the fully matched pairs (see 8.5), and these findings emphasise the importance of the detailed micro-level data collection and subsequent matching exercise that was central to this research.

The first stage in the analysis was to see if the properties were drawn from the same population in 1973. This is Test 1 which is explained in 8.4.1. The results of this test are set out in Table A8.1 and A8.2.

**Table A8.1: Pre-Divergence Equivalence in 1973**

Industrial Data-set A2: Partly matched pairs: 114 cases, 57 pairs

**Variable:** 1973 Rateable Value per $m^2$

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Enfield | 57 | 6.71 | 1.434 | .1899 |
| Haringey | 57 | 6.81 | 1.203 | .1594 |

| Paired Samples T-Test | t Value | Degrees of Freedom | 2-tail Probability |
|---|---|---|---|
| Equality of mean values | -.369 | 56 | .714 |

Table A8.1 shows the results from the testing of Hypothesis 1. The result conforms to the predicted outcome and the null hypothesis for Test 1 is accepted (p=0.714). This confirms the premise that the data within Data-set A2 is drawn from the same population of properties in 1973, before the rate burdens diverged.

**Table A8.2: Equality of Total Occupation Costs in 1973**

Industrial Data-set A2: Partly matched pairs: 114 cases, 57 pairs

**Variable:** 1973 Rateable Value per $m^2$

| Cost | Number of Cases | Enfield | Haringey | Percentage Difference |
|---|---|---|---|---|
| Average Rental Value | 114 | £6.71 $m^2$ | £6.81 $m^2$ | 1.5% |

In Table A8.2 the average rental value per $m^2$ for industrial property in the two boroughs in 1973 is tested for equality (Hypothesis 2). The result can be seen to be extremely close.

The results of the Pre-test analysis suggest that the properties were drawn from the same population in 1973 and the next stage is to carry out the Post-test analysis to see if rents have diverged (see 8.4.2).

**Table A8.3: Post-Divergence Impact in 1988**

Industrial Data-set A2: Partly matched pairs: 114 cases, 57 pairs

**Variable:** 1988 Rental Value per $m^2$

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Enfield | 57 | 37.06 | 4.656 | 0.6167 |
| Haringey | 57 | 35.71 | 4.546 | 0.6022 |

| Paired Samples T-Test | t Value | Degrees of Freedom | 2-tail Probability |
|---|---|---|---|
| Equality of mean values | 1.547 | 56 | .127 |

Table A8.3 shows the results of testing Hypothesis 3. Contrary to the predicted outcome, the null hypothesis for Test 2 is accepted and the central hypothesis of this thesis is not confirmed in statistically significant terms (at least at the 13% level). There does seem to be some impact on the outcome variable of rent, but not at a level that can be treated as significant in the terms defined in this thesis (see 8.2).

The last stage in the analysis was to compare the difference in locations in the period 1988 to see if total occupation costs had equalised under the Test 3 hypotheses (see 8.4.3).

**Table A8.4: Total Occupation Costs in 1988**

Industrial Data-set A2: Partly matched pairs: 114 cases, 57 pairs

**Variable:** Total Occupation Costs per $m^2$ (Rent + Rate Burden)

| Local Authority | Number of Cases | Mean | Standard Deviation | Standard Error |
|---|---|---|---|---|
| Enfield | 57 | 49.51 | 6.773 | .8970 |
| Haringey | 57 | 54.07 | 6.669 | .8834 |

| Paired Samples T-Test | t Value | Degrees of Freedom | 2-tail Probability |
|---|---|---|---|
| Equality of mean values | -3.548 | 56 | .001 |

Table A8.4 shows the results of testing Hypothesis 4. The result is statistically significant (at a better than 1% level), which is not the predicted outcome for this test, the proposition being that, after the period of equalisation, the properties in the two boroughs will again share equal total occupation costs.

This result strongly suggests that the two samples are drawn from different populations and, when compared to the results of this test presented earlier for fully matched pairs (Table 8.13), the outcome is quite different.

**Table A8.5: Equalisation of Total Occupation Costs in 1988**

Industrial Data-set A2: Partly matched pairs: 114 cases, 57 pairs

**Variable:** Total Occupation Costs per $m^2$ (Rent + Rate Burden)

| Cost | Number of Cases | Enfield | Haringey | Percentage Difference |
|---|---|---|---|---|
| Average Rate Burden | 57 | £12.45 $m^2$ | £18.36 $m^2$ | 32.2% |
| Average Rental Value | 57 | £37.06 $m^2$ | £35.71 $m^2$ | -3.8% |
| Total Occupation Costs | | £49.51 $m^2$ | £54.07 $m^2$ | 8.4% |

Table A8.5 is a test of Hypothesis 5 which does not provide strong confirmation of the prediction that total occupation costs will be equalised, although rents in Haringey are slightly lower (3.8%) than in Enfield. Rents do appear to have adjusted in the direction expected, bearing in mind that in 1973 the rents in Haringey were 1.5% higher than in Enfield. The result must be considered in conjunction with the statistical test shown in Table A8.4, which confirms the finding that the total occupation costs have not been equalised for this sample data.

It was expected that the partly matched pairs would give consistent (but weaker) results. This weaker relationship was found for the outcome variable of rent in 1988 (the results were statistically significant at a level of 13%) but the statistical results for the equalisation of total costs strongly suggest that the samples represent two different populations. It could be that the matching process is a critical factor in the success of the research design: it is undoubtedly important, but the results obtained from applying this design to Sibley's unpaired market data suggest that tight matching is not a necessary pre-condition (unless Sibley did in fact pair his data more closely than his methodology description would suggest).

Alternatively, there is always a possibility with any sample data that they are not a representative sample of the population, and perhaps this applies to the partly matched pairs contained in Data-set A2.

# APPENDIX 9

# SIZE-INDEPENDENT TEST FOR RENTAL GROWTH

## A9.1 INTRODUCTION

The definitional analysis presented in this appendix, which tested for rental growth between 1973 and 1988, is based on the same data-sets that were used for the primary analysis. This analysis is based on Test 4 (see 8.8.1) and it is predicted that the null hypothesis will be rejected and $H_2$ will be accepted, with higher rental growth being found in the low rate areas.

The growth calculation is carried out without regard to property size (in $m^2$) and it is used to check on the results of the primary analysis because size was the least accurately measured of the four main variables (see 7.4).

Two separate variables are used in these calculations of rental growth between 1973 and 1988: the 1973 Rateable Value and the 1990 Rateable Value, both acting as a proxy for rental value. This shows rental growth over a period of fifteen years.

## A9.2 DIFFERENTIAL RENTAL GROWTH – 1973–88

The size-independent nature of the test is intended to validate the results discussed in Sections 8.5–8.7 above.

**Table A9.1: Average Annual Rental Growth – 1973–1988**

Industrial Data-set A1: Fully matched pairs: 70 cases, 35 pairs

| Local Authority | Cases | 1973–1988 |
|---|---|---|
| Enfield | 35 | 12.7% pa |
| Haringey | 35 | 7.5% pa |

The result in Table A9.1 is a test of Hypothesis 6 and it confirms the prediction that rental growth in the low rate area will be higher than rental growth in the high rate area. For Enfield and Haringey this difference is quite clear ($H_2$ is accepted).

**Table A9.2: Average Annual Rental Growth – 1973–1988**

Retail Data-set C1: Fully matched pairs: 42 cases, 21 pairs

| Local Authority | Cases | 1973–1988 |
|---|---|---|
| Barnet | 21 | 14.2% pa |
| Brent | 21 | 13.3% pa |

Table A9.2 shows a result that confirms the prediction that rental growth in the low rate area will be higher than the high rate area ($H_2$ is accepted), but there is not a marked difference, with 0.9% per annum difference between Barnet and Brent.

**Table A9.3: Average Annual Rental Growth – 1973–1988**

Office Data-set E1: Fully matched pairs: 42 cases, 21 pairs

| Local Authority | Cases | 1973–1988 |
|---|---|---|
| Westminster | 21 | 15.4% pa |
| Camden | 21 | 15.0% pa |

Table A9.3 shows the test of Hypothesis 6 for office property in Westminster and Camden with $H_2$ being accepted. The difference in rental growth rates is small (0.4% per annum) although the rental growth still conforms to the prediction of higher growth in the low rate area.

## A9.3 DISCUSSION OF SIZE-INDEPENDENT TEST

The rental growth test is a check on the outcome variable of rent in 1988, which was analysed as part of the primary analysis in Test 2 (see 8.4.2). This test is being used here to provide a cross-check on the primary results that is independent of the size observation. It automatically follows that growth must have taken place if the outcome variable in 1988 shows tax capitalisation (see 8.8.2) and for each property type the predicted relationship is identified, with higher growth in the low rate borough.

The calculation of growth is based on only two observations, one at the start and one at the end of the period. This provides no information about differing growth rates within the 15-year period that is covered. For office property, for example, rental value between 1973 and 1983 showed very poor growth (Debenham Tewson & Chinnocks 1983).

There are several possible explanations for the small difference between boroughs for offices, but a calculation of office rental growth applied to the average rental value per $m^2$ in 1973 and the average rental value per $m^2$ in 1988, gave a growth differential between Camden and Westminster of 0.5% per annum. This result, which takes account of size, tends to confirm the validity of the size-independent rental growth test, which gave a difference of 0.4% per annum between boroughs for office property.

# APPENDIX 10

# DECISION RULES USED IN MATCHING CRITERIA

This appendix sets out additional decision rules that were applied to the matching criteria discussed in 7.5. It provides additional information on how the properties were matched against the criteria that are shown in Figures 7.1a, 7.1b and 7.2a

**Table A10.1: Distance from junction with major road**

| *Industrial* | North Circular Road (A406) - Great Cambridge Road (A10)<br>Approximate distance (measured as travel distance by road) |
|---|---|
| < 0.5 Kilometers | |
| 0.6 – 1.0 Kilometres | |
| > 1.0 Kilometres | |

**Table A10.2: Distance to nearest rail or underground station**

| *Industrial* | Approximate distance (measured as travel distance on foot) |
|---|---|
| < 0.5 Kilometers | |
| 0.6 – 1.0 Kilometres | |
| > 1.0 Kilometres | |

**Table A10.3: Distance to local shops**

| *Industrial* | Approximate distance (measured as travel distance on foot) |
|---|---|
| < 200 metres | |
| 201 – 500 metres | |
| > 500 metres | |

**Table A10.4: Eaves height**

| *Industrial* |
|---|
| < 4.0 metres |
| > 4.0 metres |

**Table A10.5: Distance to parking**

| *Industrial* | Approximate distance (measured as travel distance on foot)<br>*Used for public car park, restricted and unrestricted on street parking* |
|---|---|
| < 200 metres | |
| 201 – 500 metres | |
| > 500 metres | |

**Table A10.6: Travel time from rail or underground station**

| *Offices* | Approximate time (timed as travel distance on foot) |
|---|---|
| < 5 minutes | |
| 5 – 10 minutes | |
| > 10 minutes | |

**Table A10.7: Distance from closest bus stop**

| *Offices* | Approximate from ground floor main entrance |
|---|---|
| < 100 metres | |
| 101 – 250 metres | |
| 251 – 500 | |
| > 500 metres | |

**Table A10.8: Distance from Aldwych**

| *Offices* | Straight line distance from centre of plot to Bush House, Aldwych |
|---|---|
| < 250 metres | |
| 251 – 500 metres | |
| 501 – 750 | |
| > 750 metres | |

**Table A10.9: Floor to ceiling height**

| *Offices* |
|---|
| < 2.5 metres |
| > 2.5 metres |

**Table A10.10: Distance to parking**

| *Offices* | Approximate distance (measured as travel distance on foot)<br>*Used for public car park, restricted and unrestricted on street parking* |
|---|---|
| < 200 metres | |
| 201 – 500 metres | |
| > 500 metres | |

**Table A10.11: Distance from pedestrian crossing**

| *Retail* | From approximate centre point of frontage |
|---|---|
| < 60 metres | |
| 61 – 120 metres | |
| > 120 metres | |

**Table A10.12: Distance from closest bus stop**

| *Retail* | From approximate centre point of frontage |
|---|---|
| < 30 metres | |
| 31 – 60 metres | |
| > 60 metres | |

**Table A10.13: Distance from on street parking**

| *Retail* | Restricted and unrestricted on street parking<br>Approximate distance (measured as travel distance on foot) |
|---|---|
| < 200 metres | |
| 201 – 500 metres | |
| > 500 metres | |

**Table A10.14: Distance from public car park**

| *Retail* | Approximate distance (measured as travel distance on foot) |
|---|---|
| < 200 metres | |
| 201 – 500 metres | |
| > 500 metres | |

**Table A10.15: Distance from nearest rail or underground station**

| *Retail* | Approximate distance (measured as travel distance on foot) |
|---|---|
| < 500 metres | |
| 501 – 1000 metres | |
| > 1000 metres | |

**Table A10.16: Frontage and return frontage**

*Retail*

| |
|---|
| < 6 metres |
| 6 – 12 metres |
| > 12 metres |

**Table A10.17: Pavement width**

*Retail*

| |
|---|
| < 3 metres |
| > 3 metres |

**Table A10.18: Qualitative categories**

| | |
|---|---|
| *All* | Apparent State of Repair, General Modernity, Prestige |
| Poor | |
| Mediocre | |
| Average | |
| Good | |
| Excellent | |

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